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# ECONOMIC ANALYSIS OF EFFLUENT GUIDELINES

## LEATHER TANNING AND FINISHING INDUSTRY

DEVELOPMENT PLANNING AND RESEARCH ASSOCIATES,
INCORPORATED

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The economic impacts of proposed effluent guidelines on leather tanning and finishing industry are assessed. The analysis includes classification and description of types of firms and plants; financial profiles, investments and operating costs, and profits for selected model plants; evaluation of pricing mechanisms and price relationships and description of analytical procedures employed. The financial impact of proposed effluent treatment technology was assessed in terms of prices, industry returns, volume of production, employment, community impact and international trade.

Imposition of the BPT level controls (1977) will have serious impact on the industry if control costs are as stated by EPA. An estimated 17 of the 176 wet processing tanning plants will be forced to close assuming that small plants with less than 50,000 GPD of wastewater and disposing into municipal treatment systems will be

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exempt from pretreatment requirements (according to EPA approximately 70 percent of the small plants discharge into municipal facilities and 60 percent of the larger plants). An additional 8 medium size plants will be forced to close in 1983. This represents 5.5 percent of the productive capacity of the industry and employment for 1,675 persons. If the municipal exemption is eliminated, it will mean the loss of 25 plants representing 5.6 percent of the industry capacity and an estimated 1,750 jobs.

Price increase as a result of BPT Standards is estimated at 1.5 percent with an additional price increase of .2 percent as the result of BAT Standards.

The loss of production will impact the leather consuming industries, principally shoe production. The lower impact will result in an estimated loss of tanned leather for 9.6 million pair of shoes and commensurate quantities of other leather goods and an additional loss of employment estimated at 5,400 jobs. Without the municipal exemption, the resulting loss in the leather consuming industry is estimated at 10.0 million pair of shoes and other leather goods and 5,611 jobs.

The proposed guidelines will adversely affect the balance of payment situation with an estimated net loss of $46 million with the municipal exemption and $48 without.

**DRAFT**

# ECONOMIC ANALYSIS OF EFFLUENT GUIDELINES
# LEATHER TANNING AND FINISHING INDUSTRY

Donald J. Wissman

September, 1974

Prepared for
Office of Planning and Evaluation
Environmental Protection Agency
Washington, D. C. 20460

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# PREFACE

The attached document is a contractor's study prepared with the supervision and review of the Office of Planning and Evaluation of the U. S. Environmental Protection Agency (EPA). Its purpose is to provide a basis for evaluating the potential economic impact of effluent limitations guidelines and standards of performance established by EPA pursuant to section 304(b) and 306 of the Federal Water Pollution Control Act.

The study supplements an EPA technical Development Document issued in conjunction with the promulgation of guidelines and standards for point sources within this industry category. The Development Document surveys existing and potential waste treatment and control methods and technologies within this category and presents the investment and operating costs associated with various control technologies. This study supplements that analysis by estimating the broader economic effects (including product price increases, continued viability of affected plants, employment, industry growth and foreign trade) of the required application of certain of these control technologies.

The study has been prepared with the supervision and review of the Office of Planning and Evaluation of EPA. The original report was submitted in fulfillment of Contract No. WA-73X-425, Task Order No. 8 by Development Planning and Research Associates, Inc. The original work was completed as of September, 1973. This study was subsequently modified in October, 1973.

This present modification was completed under Purchase Order P4-01-03196 dated April 18, 1974. The work was completed as of September, 1974.

This report represents the conclusions of the contractor. It has been reviewed by the Office of Planning and Evaluation and approved for publication. Approval does not signify that the contents necessarily reflect the views of the Environmental Protection Agency. The study has been considered, together with the Development Document, information received in the form of public comments on the proposed regulation, and other materials in the establishment of final effluent limitations, guidelines and standards of performance.

# I. INTRODUCTION

The purpose of this study is to analyze the economic impact of the cost of proposed effluent control guidelines on the leather tanning and finishing industry. These requirements are being developed by EPA pursuant to the Federal Water Pollution Control Amendments of 1972.

The initial impact study for the leather tanning and finishing industry, completed by Urban Systems Research and Engineering, Inc. in December, 1971, included part of the requirements of the basic scope of work for the current study. This study will concentrate on updating, improving, expanding upon and adding detail to the earlier study and on expanding the financial analysis and economic impact evaluations.

This report was originally completed in September, 1973. Following substantial revisions by EPA of the original costs for effluent control, a revised report was completed in October, 1973 with basically the same industry background information but a revised impact section. Further modification was made by EPA in the Standards including alternative Standards for small sized plants. The result of these modifications are considered in this report.

The three levels of treatment plus pretreatment for plants disposing of water into municipal systems are as follows:

1. Best practicable control technology currently available (BPT) - to be met by industrial dischargers by 1977.
2. Best available technology economically achievable (BAT) - to be met by 1983.
3. New source performance standards (NSPS) - to be applied to all new facilities (that discharge directly to navigable waters) constructed after the promulgation of these guidelines (approximately January 1, 1974).
4. Pretreatment standards - in this case to be applied to all facilities that use municipal systems.

## A. Data Sources

The most commonly used and in many cases the most readily available source of industry information including employment, location, value of shipment and product data is the Census of Manufactures. In addition to the Census, other sources were used where applicable. Much of the detailed statistical information on the industry was drawn from the compilation and tabulation of the Tanners' Council of America, Inc. Generally, the Census information is in agreement with data compiled by the Tanners' Council.

There is a dearth of published information regarding the tanning industry, particularly regarding industry structure, pricing, import-export implications and other economic analyses. The USDA has published over the years a few brief definative reports but compared with other industries in the agriculture processing areas, study of the industry has been neglected. We have used the sources described where applicable but have relied on personal discussions with knowledgeable individuals to provide the needed insight to the industry.

Financial data for the industry is particularly limited and was drawn largely from information made available on a confidential basis to the staff of the Tanners' Council. In addition, information taken from Troy's Almanac of Business and Industrial Financial Ratios and other sources were used where applicable.

In addition to the present study there have been earlier studies completed on the tanning industry with regard to the impact of pollution control facilities. Relevant data from the following studies are included herein.

1. USDI Federal Water Pollution Control Administration, The Cost of Clean Water, "Volume III, Industrial Waste Profile No. 7 - Leather Tanning and Finishing." September, 1967.
2. The President's Council on Environmental Quality, The Leather Industry - A Study of the Impact of Pollution Control Costs. Prepared by Urban Systems Research and Engineering, Inc. December, 1971.
3. U. S. Environmental Protection Agency, Development Document for Effluent Limitation Guidelines and Standard of Performance - Draft. Prepared by Stanley Consultants, Inc., June, 1973. (Hereafter referred to as Development Document).

## II. INDUSTRY SEGMENTS

The Census of Manufacturers classifies the leather tanning and finishing industry (SIC 3111) into three types of establishments. These are establishments that are primarily engaged in the tanning, curing and finishing hides and skins into leather. The three types of classifications that are used include:

1. "Regular tanneries" - the regular tannery purchases raw materials, employs production workers in the plant to tan, curry and finish hides and skins, and sells the finished product. In effect, this type of establishment performs all of the usual manufacturing functions within one organization.

2. Converter - the converter typically performs only the entrepreneural functions of the manufacturing concern such as buying raw materials, and arranging processing with outside factories, i.e. contract tanneries for the production of the finished leathers. The actual tanning and finishing of hides and skins is done on contract by the contract tanneries.

3. Contract tanneries - the contract tanner employs production workers in his own establishment to process materials owned by converters, makes products to specification but does not become involved in the sale of the finished product.

It should be noted, however, that the above classification is not mutually exclusive since some firms in the industry act as both regular tanners, and leather converters or as regular tanners and contract tanners.

The Census has used the primary plant operation as the delineating classification criteria. If the direct wage and salary payments for one category were less than the payments for the second, the plant was classified according to the category in which the highest amount of wage and salary payments were made.

## A. Characteristics of Firms in the Leather Tanning and Finishing Industry

The leather tanning and finishing industry consists of a wide diversity of types of firms. Firm ownership ranges from family-owned companies and closely held corporations to divisions of large conglomerates. As a result, information regarding operating characteristics is closely held or else combined with operation statements of large corporations where meaningful segregation is not possible.

Information regarding this industry must out of necessity be derived from traditional sources of information such as the Census of Manufactures and the published reports of the Internal Revenue Service. These two sources have their limitations as frequently results are aggregated into the SIC 31 Leather and Leather Products Major Group.

For convenience purposes and because the industry consists largely of single firm plants, the characteristics of firms and characteristics of plants will be discussed in conjunction in the following sections. Relevant distinctions will be made as required.

### 1. Number of Firms

The Census of Manufactures lists the number of companies and number of establishments as follows:

| Year | No. of Companies | No. of Establishments |
|---|---|---|
| 1958 | 521 | 578 |
| 1963 | 482 | 525 |
| 1967 | 474 | 519 |

Table II-1 shows the total number of establishments in the leather tanning and finishing industry by classification. In 1967, 60% of the establishments were classified as tanneries which was an increase from 54% in 1963. The number of converters increased slightly from 1963 to 1967 accounting for 13% of the plants in 1967. Contract tanneries on the other hand declined from 180 or 34% of the total number of plants in 1963 to 26% of the plants in 1967.

Table II-1. Total number of establishments in the leather tanning and finishing industry by classification

| | Total | Tanneries | Converter | Contract Tanneries |
|---|---|---|---|---|
| | | 1963 | | |
| No. of Establishments | 525 | 284 | 61 | 180 |
| With 1 - 19 employees | 269 | 133 | 50 | 86 |
| With 20-99 employees | 166 | 81 | 10 | 75 |
| With 100 employees or more | 90 | 70 | 1 | 19 |
| | | 1967 | | |
| No. of Establishments | 519 | 314 | 70 | 135 |
| With 1 - 19 employees | 261 | 163 | 52 | 46 |
| With 20 - 99 employees | 171 | 91 | 13 | 67 |
| With 100 employees or more | 87 | 60 | 5 | 22 |

Source: Census of Manufacturers, 1967.

A tabulation by the Tanners' Council of America indicates a total of 399 companies with 431 plants (including converters) in the industry as of 30 June, 1973. Their records also indicate a total of 33 plants (establishments) have ceased operations between the period of 1 January 1968 and 30 June 1973. This would, in effect, reduce the 519 firms to 486 as of the present date. This leaves a difference between the Census figures and the Tanners' Council list of 55 plants. It is believed that this number reflects miscellaneous small operators, many of which would be classified as taxidermists by the Tanners' Council rather than tanners or finishers.

A further breakdown of plant numbers would include approximately 70 "establishments" that are converters and handle only entrepreneural functions. This leaves a total of 361 manufacturing plants. Of this number, 185 are dry process finishers only which do not use water in the manufacturing process. According to the data supplied by Tanners' Council, this leaves a total of 176 plants that must be considered herein.

### 2. Size of the Firms

Based on number of employees, an indication of size of plant is available from the Census of Manufacturers (Table II-1). Plant size appears to have remained relatively constant between the period of 1963 and 1967. In 1963, 51% of the total plants had less than 19 employees. This had decreased to 50% by 1967. Thirty-two percent of the plants in 1963 and in 1967 employed between 20 and 99 employees and 17% had 100 employees or more.

When number of employees and type of operation are compared, we find that little change has occurred in size structure during the period '63 to '67. Approximately 52% of the tanneries had less than 10 employees in 1967. Twenty-nine percent had between 20 and 99 employees and 19% had more than 100 employees in 1967. This is basically the same as the size structure in 1963; however, in the tannery classification, the number of plants with 100 employees or more amounted to 24% of the total tanneries. The size structure of the converters also remains essentially the same with a slightly larger percentage of the plants falling into the 100 employee category in 1967 than in '63. For contract tanneries we see a slight shift toward higher number of employees than in the other two classifications. Only 34% of the plants have less than 19 employees in 1967 as compared with 47% in 1963. Plants with more than 100 employees amounted to 16% of the total in '67 as compared with 11% in 1963.

A further indication of size of firms can be obtained from Table II-2. In 1970 the four largest companies accounted for 21 percent of the value of industry shipments. This is approximately the same percentage as existed in 1935. The eight largest companies account for 31 percent of shipments and the largest 50 companies about 71 percent of the total. Using the total number of companies in 1967 as reported by Census, i.e., 47, the largest 10 percent of the companies control 70 percent of the shipments.

Data for the most recent year, 1972, reflects a similar size structure for the industry. According to data obtained from the Tanners' Council. 41 firms or 10.3 percent of the total accounted for 69 percent of sales. This included companies ranging in size from $5 to $50 million (Table II-3). The medium sized companies ranging in size from $1 to $5 million in sales account for 28 percent of the companies and 15 percent of sales while the small companies with less than $1 million of sales account for 64 percent of the companies but only 16 percent of the sales.

### 3. Age of Plant and Level of Technology

The leather tanning and finishing industry can be described as having basically old plants in terms of actual brick and mortar with slightly over 70 percent of the plants 50 years of age or older. From the membership records of the Tanners' Council, the age of plants, tanning and/or finishing leather, converter excluded, is as follows:

| | Plant Units |
|---|---|
| Less than 10 years | 3 |
| 10-15 years | 5 |
| 15-20 years | 11 |
| 20-30 years | 17 |
| 30-50 years | 68 |
| over 50 years | 257 |
| Total | 361 |

Although the majority of industry units are in old buildings, a substantial number of plants have been rebuilt, modernized and re-equipped at a cumulative cost approaching the capital investment required for new plants. The Urban Systems and Engineering report (2) categorizes the level of technology for existing plants as older, prevalent, and new, i.e., 1950, 1963 and 1967 vintage respectively.

Table II-2. Percent of value of shipments accounted for by the largest companies in the leather tanning and finishing industry, 1935-1970

| Year | Companies[1] | Value of industry shipments[2] | | | | | Primary product specialization ratio[4] | Coverage ratio[5] |
|---|---|---|---|---|---|---|---|---|
| | | Total | Percent accounted for by–[3] | | | | | |
| | | | 4 largest companies | 8 largest companies | 20 largest companies | 50 largest companies | | |
| | (number) | (million dollars) | | | | | (percent) | (percent) |
| ...1970.... | (NA) | 793.3 | 21 | 33 | (NA) | (NA) | (NA) | (NA) |
| 1967.... | 474 | 870.1 | 20 | 31 | 50 | 71 | 98 | 99 |
| 1966.... | (NA) | 840.5 | 19 | 30 | (NA) | (NA) | (NA) | (NA) |
| 1963.... | 482 | 738.4 | 18 | 30 | 47 | 70 | 99 | 100 |
| 1958.... | 520 | 732.4 | 18 | 30 | 47 | 68 | 100 | 100 |
| 1954.... | 525 | 706.3 | 18 | 28 | 48 | (NA) | 98 | 100 |
| 1947.... | 580 | 1,070.3 | 27 | 39 | 53 | (NA) | 100 | 100 |
| 1935.... | (NA) | (NA) | 23 | 34 | (NA) | (NA) | (NA) | (NA) |

Source: Annual Survey of Manufactures.

Table II-3. Distribution of companies and plants by dollar volume, 1972

| Company Size ($ 000,000) | Volume $ | Volume % | Companies No. | Companies % |
|---|---|---|---|---|
| 5 - 50 | 545 | 69.2 | 41 | 10.3 |
| 1 - 5 | 116 | 14.7 | 102 | 25.6 |
| Under 1 | 127 | 16.1 | 256 | 64.1 |
| Total | 788 | 100.0 | 399 | 100.0 |

Source: Tanners' Council of America, Inc.

Using this classification sheme, 20 percent of the plants were placed in the older category and the remainder of the plants were classified in the prevalent and newer category. Level of technology by size of plant is defined as follows:

| Plant size | Hides No./day | Percent plants of this size | Percent of plants this size in technology level | |
|---|---|---|---|---|
| | | | Older | Newer & Prevalent |
| Small | 300 | 10 | 55 | 45 |
| Medium | 300-800 | 50 | 30 | 70 |
| Large | 800 | 40 | 5 | 95 |

Source: Urban Systems and Engineering, "The Leather Industry - A Study of the Impact of Pollution Control Costs."

### 4. Location

Leather tanning and finishing establishments tend to be concentrated in the Northeastern region of the country. As shown in Table II-4, nearly 50 percent of the total number of establishments are located in Massachusetts and New York, 28 and 21 percent respectively. New Jersey reported 9 percent of the plants in 1967.

The second area of concentration is the East North Central region with Wisconsin reporting 30 plants or 5.8 percent of the total. Other states of importance in this region include Ohio, Illinois and Michigan. The remaining plants are scattered widely throughout the United States.

Historically, tanneries were located throughout the country near the source of hides. A concentration did develop in the early 1900's in the East and North Central region around Chicago and Milwaukee, but the recent trend again would be to locate in and around the sources of hides. With the relatively recent spatial dispersion of slaughter facilities away from the traditional centers such as Kansas City and Chicago, we can expect to see new tanneries follow the same trend.

### 5. Number of Products

Six major categories of animal skins are used today in addition to imported rare skins such as alligator, crocodile, etc. They are as follows: cattlehides, kipskins and calfskins; sheep and lamb skins; goat and kidskins; pigskins; horsehides; and deer and elk skins.

The products of the industry can be identified in traditional terms based upon primary raw materials employed and end use.

Table II-4. Location of leather tanning and finishing establishments by primary state and region, 1967

| Region | 1967 | | | | 1963 | | | |
|---|---|---|---|---|---|---|---|---|
| | Total Industry | | Establishment with 20 or More Employees | | Total Industry | | Establishment with 20 or More Employees | |
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| New England Region | 183 | 35.3 | 93 | 36.0 | 195 | 37.2 | 89 | 34.8 |
| Maine | 16 | 3.1 | 14 | 5.4 | 1/ | - | 1/ | - |
| New Hampshire | 18 | 3.5 | 15 | 5.8 | 17 | 3.3 | 15 | 5.8 |
| Vermont | 1 | 0.2 | 1 | 0.4 | 1/ | - | 1/ | - |
| Massachusetts | 146 | 28.1 | 62 | 24.0 | 162 | 30.9 | 60 | 23.4 |
| Other | 2 | 0.4 | 1 | 0.4 | | | | |
| Middle Atlantic Region | 176 | 33.9 | 68 | 26.4 | 188 | 35.8 | 76 | 29.7 |
| New York | 108 | 20.8 | 30 | 11.6 | 109 | 20.8 | 30 | 11.7 |
| New Jersey | 48 | 9.2 | 25 | 9.7 | 53 | 10.1 | 26 | 10.2 |
| Pennsylvania | 20 | 3.9 | 13 | 5.1 | 26 | 5.0 | 20 | 7.8 |
| East North Central Region | 74 | 14.2 | 51 | 19.8 | 67 | 12.8 | 48 | 18.8 |
| Ohio | 12 | 2.3 | 7 | 2.7 | 1/ | - | 1/ | - |
| Indiana | 3 | .6 | 3 | 1.2 | 1/ | - | 1/ | - |
| Illinois | 19 | 3.6 | 12 | 4.7 | 20 | 3.8 | 13 | 5.1 |
| Michigan | 10 | 1.9 | 5 | 1.9 | 7 | 1.3 | 5 | 1.9 |
| Wisconsin | 30 | 5.8 | 24 | 9.3 | 27 | 5.1 | 22 | 8.6 |
| West North Central Region | 13 | 2.6 | 7 | 2.7 | 9 | 1.7 | 4 | 1.5 |
| Minnesota | 2 | .4 | 1 | 0.4 | 1/ | - | 1/ | - |
| Missouri | 6 | 1.2 | 5 | 1.9 | 1/ | - | 1/ | - |
| Other | 5 | 1.0 | 1 | .4 | 1/ | - | 1/ | - |

(continued)

Table II-4. Location of leather tanning and finishing establishments by primary state and region, 1967 (cont'd)

| Region | 1967 | | | | 1963 | | | |
|---|---|---|---|---|---|---|---|---|
| | Total Industry | | Establishment with 20 or More Employees | | Total Industry | | Establishment with 20 or More Employees | |
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| South Region | 47 | 9.0 | 30 | 11.6 | 42 | 8.0 | 30 | 11.7 |
| South Atlantic Division | 26 | 5.0 | 18 | 7.0 | NA | | NA | - |
| Delaware | 6 | 1.1 | 6 | 2.3 | 7 | 1.3 | 7 | 2.7 |
| Maryland | 2 | 0.4 | 1 | 0.4 | 1/ | - | 1/ | - |
| Virginia | 4 | 0.8 | 4 | 1.6 | 1/ | - | 1/ | - |
| West Virginia | 4 | 0.8 | 4 | 1.6 | 1/ | - | 1/ | - |
| North Carolina | 2 | 0.4 | 2 | 0.7 | 1/ | - | 1/ | - |
| Georgia | 2 | 0.4 | 1 | 0.4 | 1/ | - | 1/ | - |
| Other | 6 | 1.1 | 0 | - | 1/ | - | 1/ | - |
| | | | | | | | | |
| East South Central Division | 12 | 2.3 | 10 | 3.9 | NA | - | NA | - |
| Kentucky | 3 | 0.6 | 3 | 1.2 | 1/ | - | 1/ | - |
| Tennessee | 9 | 1.7 | 7 | 2.7 | 10 | - | 7 | 2.7 |
| | | | | | | | | |
| West South Central Division | 9 | 1.7 | 2 | 0.8 | 1/ | - | 1/ | - |
| Texas | 7 | 1.3 | 2 | 0.8 | 1/ | - | 1/ | - |
| Other | 2 | 0.4 | 0 | - | 1/ | - | 1/ | - |
| | | | | | | | | |
| Pacific | 26 | 5.0 | 9 | 3.5 | 24 | 4.5 | 9 | 3.5 |
| California | 15 | 2.9 | 8 | 3.1 | 17 | 3.2 | 8 | 3.1 |
| Other | 11 | 2.1 | 1 | 0.4 | 7 | 1.3 | 1 | - |
| | | | | | | | | |
| Total | 519 | 100.0 | 258 | 100.0 | 525 | 100.0 | 256 | 100.0 |

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1/ Included in division total
Source: Census of Manufacturers

## CATTLEHIDES:

CATTLE SIDE LEATHER. This is the principal product of the industry which accounts for approximately 64% of total industry sales. End use includes--shoe uppers, linings, garments, gloves, sporting goods, handbags, small leather goods, and waist belts. Side leather is primarily chrome tanned.

CATTLE SIDE SPLIT LEATHER. Cattle side split leather is a by-product of hides which is not processed in full thickness. Used for shoe uppers, linings, insoles, work gloves, small leather goods, handbags, protective industrial clothing. Chrome tanned; processed by side leather tanners or sold to "split tanners" for finishing into specialized products.

SOLE LEATHER. Almost entirely vegetable tanned. Major use is for shoe soles. Secondary uses include welting, counters, box toes, waist belts.

CATTLE SIDE PATENT LEATHER. Sub-class of chrome tanned cattle sides finished with special compounds (polyurethanes) for glossy surface.

KIP SIDE LEATHER. Leather tanned from kips which are small hides, intermediate between calfskins and cattlehides. Used almost entirely for shoe uppers.

UPHOLSTERY LEATHER. Mainly vegetable tanned; some chrome retannage. End use includes automotive and furniture upholstery.

HARNESS AND SADDLERY LEATHER. Composite group of the same plants but possessing different characteristics useful for various parts of equine equipage or related uses. (Collar, harness, skirting, latigo, bridle, etc.) Also used for holsters, gun cases, etc.

SPORTING GOODS LEATHER. Combination tannages of chrome, vegetable, alum, glutaraldehyde used for footballs, baseballs, baseball gloves and laces.

BAG, CASE & STRAP LEATHER. Trade description for specialized group of leathers which are vegetable, chrome and combination tanned. End use includes luggage, briefcases, small leather goods, decorative items, equipment cases, straps, and heavy bookbinding.

MECHANICAL LEATHER. Vegetable, chrome and impregnated leather for industrial uses including belting, gaskets, washers, seals for equipment.

CALFSKINS: Chrome tanned leather from skins of immature cattle used for shoe uppers and handbags. Volume is in sharp decline due to shrinkage of raw material supply.

SHEEP AND LAMB SKINS: Second largest raw material category. Chrome alum, oil and combination tannages for garments, gloves, shoe uppers and linings, handbags and wallets, bookbinding and chamois.

GOAT AND KID LEATHER SKINS: Chrome tanned in smooth or suede finish used for shoe uppers and linings.

PIGSKIN: Vegetable or chrome tanned shoe uppers, gloves, garments, and small leather goods.

HORSE HIDES: Chrome and vegetable processed for shoe uppers, garments, baseballs. Cordovan is included in this group.

DEER AND ELK HIDES: Chrome and vegetable tanned for gloves, garments, and to minor degree for shoe uppers (buckskin).

MISCELLANEOUS AND EXOTIC LEATHERS: Aggregate volume is minor and the number of producers in the U. S. is less than 10. Products include Kangaroo for athletic shoe uppers, reptile for shoe uppers, belts, and small leather goods, Peccary and Carpincho for gloves.

In summary, cattlehides are the dominant raw material of the industry with the major products of Cattle Side leather, Sole leather, Upholstery, Garment and Bag, Case & Strap leathers. Sheep and Lamb skins are the second and much smaller raw material base yielding mainly garment and glove leather, lining and shoe stock, chamois and leather for small leather goods.

## 6. Level of Integration

The industry is not characterized by any appreciable integration either back to the raw material supply or forward to finished and fabricated leather products. There is, in fact, less integration in 1973 than several years ago when two major packers owned tanning facilities and four leading shoe manufacturers operated tanning plants. In 1973 the only firm that has integrated toward the raw material is the A. C. Lawrence Leather Co. (Swift). Armour and Company, which had operated the Armour Leather Company for two generations, recently sold its leather subsidiary and liquidated all leather operations. The Brown group (Brown Shoe) still operates a cattle side upper leather plant as does Genesco. However, Endicott Johnson and Interco have sold or liquidated all tanning enterprises. It is estimated that the sales volume of tanning or finishing units integrated with raw material producers is less than 6% of gross annual volume. Leather tanning facilities owned or operated by manufacturing companies account for an even smaller percentage of leather sales or value.

## 7. Level of Diversification

The annual survey of manufacturers shows the leather tanning and finishing industry with a very high specialization ratio of 98 percent for 1967. This indicates that 98 percent of sales are in the primary SIC code. The typical production unit of the industry is not diversified for two main reasons. First, tanning equipment and processes are specialized and non inter-changeable in terms of raw material or end product. For example, equipment suitable for tanning and finishing skins cannot be used for hides, and per contra. Hence, most plants have confined production to a very limited range of product. Second, shoe manufacturing has been and still is the principal consuming industry. In 1962 shoes accounted for 83% of all leather used. By 1972 this ratio had declined to 74%, and tanneries were seeking to diversify output. Cattle side leather plants entered the garment leather market and sought outlets in waist belts, handbags or small leather goods. However, this trend does not reflect diversification of basic product line. It indicates, rather, an effort to adapt available plant and equipment to moderately different needs of end uses other than shoes.

A further observation is pertinent. Tanning machinery and equipment cannot be adapted for any purpose other than treating hides and skins. It is fixed capital which must be written off at scrap value in the absence of demand for used machines.

### 8. Efficiency

By the historic standards of the industry, productivity is high. Value added per production worker has increased from $4.84 in 1960 to $8.00 in 1970 representing an average annual increase of 5.2 percent. Stated in physical terms, production per man hour in cattle side upper leathers has increased 40% in the past decade according to records of the Tanners Council. Side leather tanners are now exceeding 60 sq. ft. per hour in the most efficient plants when 42 sq. ft. per hour was considered very good ten years ago.

## B. Industry Segments

The leather tanning and finishing industry has traditionally been segmented by type of leather manufactured such as cattlehide leathers, sheep and lamb skins, goat etc. Most of the industry production data are given in these terms. The Development Document, however, categorizes the industry by manufacturing processes. This is more appropriate for evaluating the imposition of pollution control on the industry since a major factor affecting the waste production in the leather industry is the type manufacturing process used to convert the various types of animal skins to finished leathers.

The following material discusses industry segments using two taxonomies (1) conventional industry segments and (2) categorization of plants by manufacturing process.

### 1. Conventional Industry Segments

Cattlehide leathers account for 81.3 percent of the total production in the leather tanning and finishing industry. The major use of cattle hide leathers is side and patent leather used for shoe uppers. This accounts for 48 percent of total leather or 59 percent of the cattleskin processed. Sheep and lamb skins are the second most important with approximately 10 percent of production (Table II-5). Further discussion on recent trends in conventional segments is contained in Chapter III.

Table II-5. Percent of production and employment by conventional industry segment

| Industry Segment | Percent of industry production | Percent of industry employment |
|---|---|---|
| Cattlehide Leathers | 81.3 | 80.7 |
| Side and Patent | 47.8 | 52.6 |
| Sole and Belt | 9.4 | 11.4 |
| Upholstery | 4.7 | 6.9 |
| Split Leather | 10.9 | 5.3 |
| Harness | 0.1 ) | |
| Bag, Case & Strap | 1.8 ) | 4.5 |
| Other[1] | 6.6 ) | |
| Calf Leather | 1.1 | 2.0 |
| Goat and Cabretta | 2.3 | 1.8 |
| Sheep and Lamb | 10.3 | 7.7 |
| Pig | 4.6 | 4.5 |
| All Other[2] | 0.4 | 3.3 |
| Convertors | n.a. | n.a. |
| | 100.0 | 100.0 |

[1] Includes sporting goods and mechanical

[2] Includes horse, kangaroo, deer, reptile and exotic types.

Source: Tanners' Council of America, Inc.

## 2. Categorization of Plants by Type of Manufacturing Process

For the purposes of establishing effluent limitation guidelines and standards of performance, the leather tanning and finishing industry has been divided into seven major categories. These categories have been developed by Standley Consultants principally by similarities in process and waste loads. The industry categories are:

| | Primary Processes | | |
|---|---|---|---|
| Category | Beamhouse | Tanning | Leather Finishing |
| 1 | Pulp hair | Chrome | Yes |
| 2 | Save hair | Chrome | Yes |
| 3 | Save hair | Vegetable | Yes |
| 4 | Hair previously removed | Previously tanned | Yes |
| 5 | Hair previously retained | Chrome | Yes |
| 6 | Pulp hair | Chrome | No |
| 7 | Hide curing | No tanning | No |

A brief description of the major process is given here. Further, more detailed descriptions are available in earlier EPA reports or in published technical description of the tanning and finishing processes
The major processes are:

1. BEAMHOUSE. This is a generic for all the initial stages of process after raw hides and skins are received at the tannery. The beamhouse entails large use of water and is a major source of tannery waste loads.

2. TANYARD. The series of steps by which putrescible hides and skins are converted into stable, nonputrescible leather through aqueous solution containing various chemical agents. Also marked by substantial water use and waste discharge.

3. RETANNING, FAT LIQUORING AND COLORING. In these process stages the specified physical properties of leather are adjusted and set prior to surface treatment. Water usage and waste loads are substantially reduced from the previous steps and processes.

4. FINISHING. Devoted largely to surface appeal and Characteristics. Unimportant with respect to use of water and waste loads.

Two qualifications must be entered with respect to the data compiled for these categories. First, converters have been eliminated since they do not perform a production function implicit in the definition. Second, addition of dollar volume for the first six categories will exceed total industry sales by virtue of intra-industry transactions such as sales of crust leather by tanners to other tanners or to finishers.

It will be obvious that the plants maintaining the full cycle of operations -- from beamhouse through finishing -- will be most seriously impacted. Such plants comprise the largest single portion of the tanning industry. Table II-6 indicates that the full cycle tanneries in categories 1, 2 and 3 account for 78 percent of the employment and 81 percent of the annual industry volume. Plants in Category 5 do not maintain beamhouses but must be concerned with effluent problems of their tanyards. In category 6, only the finishing operation is obviated.

The plants in category 4 are engaged only in finishing operations on leather that was tanned elsewhere (essentially dry process). Water is not used in the production process and for this reason this category is not considered further in the analysis. There are a total of 185 plants in this segment and of this number 94 percent have less than 50 employees which places them in the small category. The remaining 6 percent fall into the medium size category. Although this group contains 51 percent of the plant, it accounts for only 7 percent of the total volume.

Category 7 is engaged in the treatment of hides or skins by packers or processors prior to movement of such raw material to tanners.

Table II-6 gives the number of plants, employees and annual volume by segment. A brief recap of plant numbers from the Census and the Tanners' Council is as follows:

| | Census | Tanners' Council |
|---|---|---|
| Total in SIC 3111 (1967) | 519 | |
| Converters | 70 | |
| Processing Plants | 449 | |
| Closures since 1967 | 33 | 33 |
| Plants in existence today | 416 | 361 |
| Dry Process | | 185 |
| Wet Process | | 176 |

Table II-6. Distribution of plants, employment and annual sales by industry segment

| Category 1/ | Description | | | No. of plants | No. of employees | Annual volume | |
|---|---|---|---|---|---|---|---|
| | Beamhouse | Tanning | Finishing | | | $million | Pct. |
| 1. | Pulp hair | Chrome | Yes | 140 | 11,750 | $470 | 57 |
| 2. | Save hair | Chrome | Yes | 7 | 2,100 | 84 | 10 |
| 3. | Save hair | Vegetable | Yes | 15 | 3,050 | 122 | 15 |
| 4. | Hair previously removed | Previously tanned | Yes | 185 | 1,630 | 62 | 7 |
| 5. | Hair previously removed or retained | Chrome | Yes | 8 | 1,835 | 68 | 8 |
| 6. | Pulp | Chrome | No | 6 | 1,115 | 29 | 3 |
| 7.2/ | Hide curing | No tanning | No | | | | |
| Total Plants | | | | 361 | 21,480 | $835 | 100 |

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1/ Categories adapted from the Development Document.

2/ 900 Principal packers; 24 hide processors other than packers.

Source: Tanners' Council of America, Inc.

It is believed the discrepancy of 55 plants between the Census records and Tanners' records may be accounted for by the exclusion of very small plants, i.e., 1 - 10 hides per day from the Tanners' records. Also, the Census records may contain certain plants engaged in taxidermy.

Table II-7 stratifies the number of wet process plants by size in the approximate categorization of the model plants. Because the only size categorization that was available was employment, it was possible only to approximate the size category in terms of "hides per day."

Category 1, pulp hair-chrome tan with a finishing operation is the most prevalent type of tanning and finishing operation with 140 plants of the total 176 wet process plants. This category accounts for 61 percent of the wet processed volume and is summarized as follows:

| | No. of Plants | Percent of Volume |
|---|---|---|
| X Small | 5 | 0.4 |
| Small | 59 | 13.1 |
| Medium | 39 | 20.1 |
| Large | 29 | 42.8 |
| X Large | 8 | 23.6 |
| | 140 | 100.0 |

The remaining wet process segments have a total of 36 plants and account for the remaining 39 percent of wet process volume. The size distribution places only 10 percent of the plants (6) in the small and X small category with the remaining plants in the medium and large categories. Thus, the volume breakdown for all wet processing plants is estimated as follows:

| | No. of Plants | Percent of Volume |
|---|---|---|
| X Small | 6 | .3 |
| Small | 64 | 9.6 |
| Medium | 48 | 16.9 |
| Large | 43 | 43.1 |
| X Large | 15 | 30.1 |
| | 176 | 100.0 |

Table II-7. Size distribution of wet process tanning and finishing plants by category, approximate size group - hides per day

| Category | 50-180 X Small | 180-540 Small | 540-1200 Medium | 1200-2600 Large | > 2600 X Large | Total plants |
|---|---|---|---|---|---|---|
| (1) | 5 | 59 | 39 | 29 | 8 | 140 |
| (2) | - | 1 | 2 | 2 | 2 | 7 |
| (3) | 1 | 3 | 3 | 8 |  | 15 |
| (5) |  | 1 | 4 | 2 | 1 | 8 |
| (6) |  |  |  | 2 | 4 | 6 |
|  | 6 | 64 | 48 | 43 | 15 | 176 |

---

1/ Based upon employment records of Tanners' Council, Inc. assumed production per man hour of 44 sq. ft. for plants with employment of 200 or more and 36 sq. ft. for plants with less than 200 for Categories 1, 2, and 3. Assume 105 ft./man hour for Category 5 and 6.

## C. Ability to Finance New Investment

The ability of a firm to finance new investment for pollution abatement is a function of several critical financial and economic factors. In general terms, new capital must come from one or more of the following sources: (1) funds borrowed from outside sources: (2) equity capital through the sale of common or preferred stock; (3) internally generated funds--retained earnings and the stream of funds attributed to depreciation of fixed assets.

For each of the three major sources of new investment, the most critical set of factors is the financial condition of the individual firm. For debt financing, the firm's credit rating, earnings record over a period of years, stability of earnings, existing debt-equity ratio and the lenders' confidence in management will be major considerations. New equity funds through the sale of securities will depend upon the firm's future earnings as anticipated by investors, which in turn will reflect past earnings records. The firm's record, compared to others in its own industry and to firms in other similar industries, will be a major determinant of the ease with which new equity capital can be acquired. In the comparisons, the investor will probably look at the trend of earnings for the past five or so years.

Internally generated funds depend upon the margin of profitability and the cash flow from operations. Also, in publicly held corporations, stockholders must be willing to forego dividends in order to make earnings available for reinvestment.

The condition of the firm's industry and general economic conditions are also major considerations in attracting new capital. The industry will be compared to other similar industries (i.e., other processing industries) in terms of net profits on sales and on net worth, supply-demand relationships, trends in production and consumption, the state of technology, impact of government regulation, foreign trade and other signficant variables. Declining or depressed industries are not good prospects for attracting new capital. At the same time, the overall condition of the domestic and international economy can influence capital markets. A firm is more likely to attract new capital during a boom period than during a recession. On the other hand, the cost of new capital will usually be higher during an expansionary period. Furthermore, the money markets play a determining role in new financing.

These general guidelines can be applied to the leather tanning and finishing industry by looking at general economic data and industry performance over the recent past.

## 1. General Industry Situation

The leather tanning and finishing industry has maintained a pre-tax profit on sales of approximately 4-5 percent over the recent past few years (Table III-1). An important consideration here is that the margin appears to be relatively stable during this period (1968-1972) in spite of a general downward trend in total volume of finished leather produced.

Return on investment as reported by the Tanners' Council as percent of profits on investment averaged 12 percent for the total industry and 14.7 percent for cattle side leather for 1972 (III-B). Information is not available for a time series on return on investment but considering the consistency of pre-tax profit on sales, it may be concluded that return on investment has been relatively stable also.

An attempt was made to determine the total assets and liabilities of the industry by using two separate data sources. The IRS-based data contained in Troy's Almanac[1] was taken from year ending 1969, the most current available. It contain the financial ratios for all firms in SIC 31 or approximately 1,890 firms. The second source was obtained from Urban Systems Report as taken from an accounting statement of 35 firms by Robert Morris Associates.[2]

By applying the various ratios contained in the respective reports to the estimated industry sales for 1972 of $788 million, two very similar patterns emerge:

| Assets | IRS-Based | | RM-Based | |
|---|---|---|---|---|
| | $ million | Pct. | $ million | Pct. |
| Current assets | 308 | 70 | 319 | 69 |
| Fixed assets | 129 | 30 | 144 | 31 |
| Total assets | 437 | 100 | 463 | 100 |
| **Liabilities and Equity** | | | | |
| Long term debt | 69 | 16 | 75 | 16 |
| Current liabilities | 125 | 29 | 125 | 27 |
| Net worth | 242 | 56 | 264 | 57 |
| Total | 432 | 100 | 463 | 100 |

---

[1] Troy, Leo, Almanac of Business and Industrial Financial Ratios, 1972 and 1973 editions, Prentice-Hall Inc., Englewood Cliffs, New Jersey.

[2] Statement by Robert Morris Associates, Philadelphia, Pa. as contained in Urban Systems Research and Engineering, Inc., The Leather Industry, A Study of the Impact of Pollution Control Costs, Vol. II, Distributed by NTIS, Dec. 1971.

## 2. Expenditures for Plant and Equipment

New expenditures as reported by the Annual Survey of Manufactures and the Census fluctuated between \$4.7 and \$7.2 million from 1960 through 1964, then increased sharply in 1965 and 1966 to \$17.3 million. Expenditures have remained at about that level since with slight declines in 1967 and 1970 (Table III-3). A closer look at the \$17.7 million spent in 1971 shows \$3.5 million or 20 percent used for new structures and plant additions and 80 percent for new machinery and equipment. Total expenditures amount to approximately 13 percent of the estimated fixed assets of the industry or 4 percent of total assets.

In addition to the new plant and equipment expenditures, Census reported purchases of used equipment of \$.5 and \$.9 million for years 1963 and 1967 respectively.

## Capital Availability

In summary, it would appear that the industry has been able to maintain a profitable position in spite of a severely declining volume. During the past five years the total physical volume of the domestic leather tanning and finishing industry has declined by approximately 33 percent due primarily to severe international competition.

The industry has a large number of family-owned and operated plants especially among the small and medium size categories. A number of the larger plants are divisions of major corporations. The family-owned plants are largely financed with internal capital and maintain a low level of long term debt. New expenditures have been modest -- mainly for equipment and consequently over 70 percent of the physical plants are over 50 years old. There has been an apparent reluctance of outside capital sources to invest in or lend money to the industry. From January 1, 1968 through June, 1973 a total of 33 plants were closed and/or liquidated. This included large plants as well as small ones.

Problems of the remaining leather tanning and finishing industry have been intensified by their ability to acquire working capital requirements at current raw material price levels (July, 1973).[1] Industry sources, including the Tanners' Council, report very critical scrutiny of industry prospects by banks and fiduciaries and reluctance to increase lending commitments to tanners. Another gauge in the situation confronting the industry is the complete lack of any market for existing facilities. Not the slightest investment interest could be found in plants closed in 1973 such such as Griess-Pfleger (Waukegan), Superior (Chicago), or Modern (Peabody, Mass.). These plants had to be liquidated and equipment sold at scrap value.

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[1] Raw material prices more than doubled from 1971 to 1973. See Table A-6.

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[1] Raw material prices more than doubled from 1971 to 1973. See Table A-6.

Table III-3. Expenditures for new plant and new equipment in the leather tanning and finishing industry ($ million)

| Year | Total new expenditures | New structures and plant additions | New machinery and equipment | Used plant and equipment |
|---|---|---|---|---|
| 1960 | 6.1 | | | |
| 1961 | 4.7 | | | |
| 1962 | 7.2 | | | |
| 1963 | 6.5 | .8 | 6.2 | .5 |
| 1964 | 7.8 | | | |
| 1965 | 11.3 | | | |
| 1966 | 17.3 | | | |
| 1967 | 16.7 | 5.2 | 12.5 | .9 |
| 1968 | 16.6 | | | |
| 1969 | 14.4 | 3.0 | 11.4 | |
| 1970 | 12.7 | 1.9 | 10.6 | |
| 1971 | 17.7 | 3.5 | 14.3 | |

Source: Census of Manufactures and Annual Survey of Manufactures.

# III. FINANCIAL PROFILE

Financial information regarding the tanning and finishing industry is particularly difficult to obtain. The industry is largely family-owned businesses. Only one firm is listed on the stock exchange (Seton Company) for which leather and leather products make up 72 percent of sales and 31 percent of pre-tax profits. Six leather enterprises are subsidiaries or operating divisions of conglomerates (Allied Kid-General Host; Armour Leather-Ahzona; Gorden State-Walter Kid; Irving Tanney-Seagrove Corp.; Pfister & Vogel-Beatrice Food and A. C. Lawrence-Swift & Company). The remainder of the industry almost without exeption, is held by family groups. As a result, profit and loss statements are not available to the public or if reported, the information is consolidated with other divisions to the point where a financial analysis of leather tanning and finishing operation is next to impossible to obtain.

Financial information obtained from IRS data published in Troy's Almanac of Business and Industrial Financial Ratios is consolidated for all firms in SIC 31. This amounts to approximately 1,800 firms. Information used to develop this chapter on the Financial Profile of the industry draws upon the above named sources where applicable. Additional financial information was obtained from the Tanners' Council, recent USDA reports regarding the cost of tanning as well as discussions with persons knowledgeable of the Tanning and Finishing industry.

## A. Plants by Segment

Sufficient information was obtained to develop representative plants for the major segment of the wet processing industry--pulp hair-chrome tan with finishing. This accounts for 140 out of 176 of the wet processing plants recorded with the Tanners' Council. This category along with category 2 would correspond roughly to the conventional cattle side leather segment is discussed in more detail in the following segments.

Insufficient data are available from the smaller segments to adequately define their performance. However, relevant observations can be drawn from facts submitted by companies representative of the remaining conventional segments to the Tanners' Council.

Table III-1. Comparison of net profits as a percent of sales before tax - model plant and industry data

| Source | X Small | Small | Medium | Large | Industry average |
|---|---|---|---|---|---|
| Model Plant Data: | | | | | |
| 1972 | -.7 | 3.0 | 6.6 | 7.4 | |
| IRS Data:[1/] | | | | | |
| 1967-68 | (.5) | 2.5 | 4.0 | 5.8 | 4.3 |
| 1968-69 | < 0 | 2.1 | 3.2 | 5.2 | 4.2 |
| Tanners' Council Survey:[2/] | | Industry | Cattle side industry | | |
| 1970 | | 3.9 | 4.8 | | |
| 1971 | | 5.1 | 5.9 | | |
| 1972 | | 3.7 | 4.6 | | |

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[1/] Taken from Troy Almanac of Business and Financial Ratios and includes industry (SIC 31) of approximately 1890 firms.

[2/] Tanners' Council of America, Inc.

### Sole Leather

Net losses have been incurred by the segment during the past three years. Adverse profit levels and huge increase in working capital requirements led to the liquidation of the Elkland Tannery (June 1973), which was the largest sole leather plant in the world. Estimated pretax return on sales ranged from losses by a majority of respondents to 1.9% in one concern.

### Sheep and Lamb Leather

In total, the firms in this group were also in a loss position during the years 1970-1972 inclusive. Volume of the group continued the decline which had begun in 1969. By 1972 input of skins fell to 18.6 million from 29.7 million in 1968. Only three companies of 16 queried stayed in the black for the period. Estimated capital loss for the entire group exceeded $3.5 million. Current problems, 1973, are even more acute because dollar devaluation severely handicaps U. S. sheepskin tanners in their attempts to purchase skins from New Zealand, the major world source.

## B. Annual Profit Before Taxes

### Net Profit on Sales

A comparison of net profits as a percent of sales before tax for the model plant segments, IRS data and information obtained from the Tanners Council Survey is shown in Table III-1. Given the differences in sources and time period, the data from the three sources is roughly compatible. Net profits before tax as a percent of sales has averaged about 4 to 5 percent over the recent past, with generally the larger firms showing a higher level of profit according to IRS data. IRS data indicates the small plants are operating at a loss. Most likely these consist of old plants largely depreciated out or operating on their depreciation. This, in fact, suggests that the extra small and small plant would not be replaced when fully depreciated out or no longer operative. This conforms with the generally accepted view, however, that these plants without additional costs for pollution abatement equipment would most likely remain in business for a considerable length of time as indicated by the relatively low closure rate over the past decade and the age of existing plants.

### Return on Investment

Information from the Tanners Council shows pretax profits on investment of 12 percent for the total industry and 14.7 for cattle side leather for 1972.

The model plant data is as follows: X small, <0; small, 8.8 percent; medium, 20.5 percent; and large, 24 percent. Casual observation suggests the model plant data may be slightly high however since the greatest percentage of plants would cluster around the small and medium size plants. The two averages appear to be relatively close (the higher industry figure of 14.7 is the segment most applicable to the model plant data).

## Annual Cash Flow

Two key facts are not definitively known and can only be estimated for the entire industry, namely, net income after tax and depreciation. The estimates given here are derived from data submitted to the Tanners Council by an extensive sample of representative companies and are averages for the years 1970-1971-1972.

| | |
|---|---|
| Net After Tax | $18,461,000 |
| Depreciation | 7,300,000 |
| Industry Cash Flow | $25,761,000 |

A similar estimate for the cattle side leather segment, the major industry group, yields the following:

| | |
|---|---|
| Net After Tax | $10,422,000 |
| Depreciation | 5,800,000 |
| Cash Flow | $16,222,000 |

These data suggest an annual cash flow as a percent of investment of 8.8 percent for the industry and 11.8 percent for the cattle side segment.

Model plant data yield an annual cash flow of 4.5 percent for the X small plant, 11.1 percent for the small plant, 16.1 percent for the medium and 17.8 percent for the large plant. Again, the model plant data reflects a slightly higher annual cash flow than industry figures from the Tanners Council.

## Market (Salvage Value of Assets)

Tanning machinery and equipment is uniquely immobile. With the exeption of motors, controls, or maintenance items generally used in industry, tanning machines can be used for no other purpose. Vats and pits used in vegetable tanneries have no conceivable application and, in the event of plant liquidation, must either be bulldozed or filled in. Tanning drums or hide processors (concrete mixers) have residual value only as scrap. Similarly, splitting machines, fleshers, stakers, finishing equipment cannot be adapted to any other industrial purpose. Embossing presses may conceivably be employed for other material but the tanning industry has been the major user of presses specifically designed for handling leather. In short, in the absence of any demand for used tannery equipment the market value of the entire range of machine installations in a tannery can only be described as scrap. Land and building, of course, have value subject to general market conditions and location.

As with other agriculture processing industries with little or no market value for wornout facilities such as the dairy processing industry, a salvage value of equal to 10 percent of the replacement cost was used as an indication of the scrap value and value of the land.

### Cost Structure

Leather tanning and finishing is a raw material oriented industry because hides and skins are the major components of cost. Information obtained from the Tanners Council indicates the following general cost structure.

Dependent on type of leather produced and raw material required, the hide and skin represents 40-60 percent of the cost of finished leather.

Fixed costs include the conventional elements in every manufacturing or processing industry, i.e., maintenance, administration, supervision, local taxes, long term interest charges, depreciation and amortization. The sum of such fixed charges in ratio to total costs per unit of sale differ considerably with types of leather produced or the number of stages conducted in the full tanning and finishing process. Sales costs are for the most part variable but a varied proportion is fixed as sales administration. Assuming a normal and average level of operation in ratio to capacity (75%-85%), fixed costs would range from 9% to 12% of total cost.

Variable costs begin with raw material and cover processing, labor, sales expense, the bulk of power and fuel charges, chemical, tanning and finishing materials, water and sewage discharge, inbound freight, raw material brokerage commissions, social security and other employment taxes, fringe benefits for employees such as vacations and holiday pay. The composite of these costs amounts to 88% to 91% of the total.

## C. Distribution of "Model" Plant Financial Data

In the absence of actual industry data for the respective industry segments model plant data were developed for the predominant category of plants by respective size groupings. These data should be interpreted as being indicative of the real industry situation. The estimated cash flow for representative plants in the leather tanning and finishing industry is shown in Table III-2. The basic source of information came from a USDA study by Fred Poats "Cattle Hides and Shoe Price" published in the Marketing Transportation Situation, August, 1972. This was supplemented from information contained in the 1967 Cost of Clean Water, Vol. III, Industrial Waste Profile, No. 7, Leather Tanning and Finishing, IRS data, and personal discussions with industry specialists.

## Variable Costs

Raw hide cost consisted of 52 percent of the finished leather price and is based on the average 1972 price of 32 cents per pound for a green salted hide. It was estimated that the average green salted hide weighed 61.5 pounds and equalled a brine cured hide of 48 pounds at 41 cents per pound. Although the published prices reflect the green salted hide in reality 80 percent of the hides purchased from packers are the brine cured variety.

Beam house operations accounted for 3.5 to 4 percent of the sale price of finished leather. Labor, tanning materials, and brokerage and freight was estimated to range from 29.5 percent of sales for the large plant to a high of 32.6 percent for the X small plant. Because of the relatively low level of automation available in the tanning industry, the economies of scale do not appear to be as great as in some industries. To achieve greater throughput larger tanneries duplicate production lines similar to those found in smaller plants.

## Fixed Cost

Fixed costs are defined as those which do not vary directly as functions of throughput. These include:

Sales, general and administrative
Plant and labor overhead
Taxes and insurance
Maintenance and repair

Separate cost estimates were not available for each of the above mentioned cost components, therefore, fixed costs were grouped. Fixed cost ranged from a high of 13.1 percent for the x small plant to a low of 8.8 percent of sales for the large.

Interest was considered a fixed cost and was estimated as .7 percent of sales. This was taken as the industry average from the IRS data.

Depreciation was estimated at 6.6 percent of replacement cost and amounted to 1.4 to 2.4 percent of sales. Data from the IRS records indicate an industry average of 1.2 ranging from a low of .8 in the small plant to a high of 2.7. This also suggests the small plants may be largely depreciated out.

Replacement cost was taken from "Cost of Clean Water" updated to 1972 with Department of Commerce's Composite Construction Index and adjusted based on industry discussion.

Gross Working Capital - was derived from IRS data and calculated at 37 percent of sales similar to the 1967-1969 industry average.

Current Liabilities - were also derived from IRS data and calculated at 17 percent of sales.

Table III-2. Estimated cash flow for representative plants in the leather tanning and finishing industry

| | X-Small 100 hides/day | | | Small 300 hides/day | | | Medium 700 hides/day | | | Large 2,000 hides/day | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Per hide | Total | Percent of sales | Per hide | Total | Percent of sales | Per hide | Total | Percent of sales | Per hide | Total | Percent of sales |
| Plant utilization | | | | | | | | | | | | |
| Hours per day | | 8 | | | 8 | | | 8 | | | 8 | |
| Days per week | | 5 | | | 5 | | | 5 | | | 5 | |
| Days per year | | 250 | | | 250 | | | 250 | | | 250 | |
| Utilization rate (percent) | | 75 | | | 80 | | | 80 | | | 85 | |
| Raw hides [1] | | 18,750 | | | 60,000 | | | 140,000 | | | 425,000 | |
| Salt cured 61.5 lb. @ $0.32/lb. or Brine cured 48 lb. @ $0.41/lb. | | | | | | | | | | | | |
| 64% raw hide (000 lbs.) | | 900 | | | 2,880 | | | 6,720 | | | 20,400 | |
| Output [2] | | | | | | | | | | | | |
| TR leather gds. 1, 2 & 3, upper shoe (000 sq. ft.) | 40 | 750 | | | 2,400 | | | 5,600 | | | 17,000 | |
| Split 8 lb./hide (000 lb.) | 8 | 112 | | | 480 | | | 1,120 | | | 3,400 | |
| Sales [3] Shoe upper 83.9¢/sq. ft. | 33.56 | 629.3 | | 33.56 | 2,013.6 | | 33.56 | 4,689.4 | | 33.56 | 14,263.0 | |
| Split | 2.00 | 37.5 | | 2.00 | 120.0 | | 2.00 | 280.0 | | 2.00 | 850.0 | |
| Total sales | | 666.8 | 100.0 | | 2,133.6 | 100.0 | | 4,969.4 | 100.0 | | 15,113.0 | 100.0 |
| Cost of raw hides [4] 70 lb. @ 26.4=18.45 | 18.45 | 345.9 | 51.9 | 18.45 | 1,107.0 | 51.9 | 18.45 | 2,583.0 | 52.0 | 18.45 | 7,891.3 | 52.2 |
| Beam house: Curing & flecking | 1.44 | 27.0 | 4.0 | 1.37 | 82.2 | 3.8 | 1.25 | 175.0 | 3.5 | 1.25 | 534.2 | 3.5 |
| Tannery: Labor | 4.43 | 83.1 | 12.4 | 4.08 | 244.8 | 11.5 | 3.55 | 496.8 | 10.0 | | 1,511.3 | 10.0 |
| Tanning materials | 4.61 | 86.4 | 13.0 | 4.61 | 276.6 | 13.0 | 4.61 | 645.9 | 13.0 | | 1,964.7 | 13.0 |
| Brokerage & freight | 1.07 | 21.4 | 3.2 | 1.07 | 64.2 | 3.0 | 1.07 | 149.1 | 3.0 | | 453.4 | 3.0 |
| Total Variable Cost | | 217.1 | 32.6 | | 667.8 | 31.3 | | 1,466.8 | 29.5 | | 4,463.6 | 29.5 |
| Total Fixed Cost | | 87.4 | 13.1 | | 236.4 | 11.1 | | 477.0 | 9.6 | | 1,330.0 | 8.8 |
| Cash Earnings | | 16.4 | 2.5 | | 122.4 | 5.7 | | 442.6 | 8.9 | | 1,428.1 | 9.5 |

Table III-2. (continued)

| | X-small 100 hides/day | | | Small 300 hides/day | | | Medium 700 hides/day | | | Large 2,000 hides/day | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Per hide | Total | Percent of sales | Per hide | Total | Percent of sales | Per hide | Total | Percent of sales | Per hide | Total | Percent of sales |
| Depreciation: Plant | | | | | | | | | | | | |
| Equipment | | | | | | | | | | | | |
| Total Depreciation 6.6% replacement value | | 16.1 | 2.4 | | 41.9 | 2.0 | | 79.2 | 1.6 | | 205.6 | 1.4 |
| Interest .7% sales 5/ | | 4.7 | .7 | | 14.9 | .7 | | 34.8 | .7 | | 105.8 | .7 |
| Pre-Tax Income | | (4.4) | .7 | | 65.6 | 3.0 | | 328.6 | 6.6 | | 1,116.7 | 7.4 |
| Income Tax | | - | | | 25.1 | | | 150.9 | | | 553.2 | |
| After-Tax Income | | (4.4) | .7 | | 40.5 | 1.9 | | 177.7 | 3.5 | | 613.5 | 4.1 |
| Replacement Values | | | | | | | | | | | | |
| Land & Building | | | | | | | | | | | | |
| Equipment | | | | | | | | | | | | |
| Total Replacement Values 6/ | | 245 | | | 635. | | | 1,200 | | | 3,115 | |
| Average Fixed Assets (1/2 replacement cost) | | 123 | | | 318 | | | 600 | | | 1,557 | |
| Total Working Capital 7/ (37% of sales) | | 247 | | | 789 | | | 1,839 | | | 5,591 | |
| Current Liabilities 8/ (17% of sales) | | 114 | | | 362 | | | 844 | | | 2,569 | |
| Net Working Capital | | 133 | | | 427 | | | 995 | | | 3,022 | |
| Average Fixed Investment | | 256 | | | 745 | | | 1,595 | | | 4,579 | |

**Footnotes for Table III-2.**

1/ Assume 70 pounds per raw hide in would yield 48 lbs of brine cured hide.

2/ Assume output of TR leather - tannery run mixture of grade 1, 2, and 3 side upper shoe leather.

3/ Assume cost of cured hide (brine cured) equals 58 percent of finished leather price (TR leather) or cost of brine cured hide equal to raw hide price $18.45 plus $1.25 for brine curing.

$$\text{Finished price} = \frac{19.70}{x} \times \frac{58}{100} = \$33.97$$

Brine cured hide weighs 48 pounds and equal to 40 sq. ft. of finished hide (1.2 lb - 1 sq ft)

Finished leather equal to 70.76 cents per pound or 84.9 cents per sq ft.

4/ Raw hide price based on average charge packer hide (salt cured) price for HNS and LNC for 1972

Fresh hide 70 lbs @ 26.3¢ per lb = $18.43
Processing cost $ 1.25
Salted hide 61.5 lbs @ 32.0¢ per lb = $19.68
or Brined Hidge 48.0 lbs @ 41.0¢ per lb = $19.68

5/ Taken from IRS data from Troy "Almanac of Business and Industrial - Financial Ratios

6/ Replacement cost taken from "Cost of Clean Water Volume III Industrial Waste Profiles No. 7 Leather Tanning and Finishing" and updated to 1972 with Dept. of Commerce's Composite Construction Index.

7/ Working capital derived from IRS data in Troy Almanac - Calculated at 37 percent of sales as average over 1967-1969

8/ Current liabilities derived from IRS data in Troy Almanac - Calculated at 17 percent of sales as average over 1967-1969.

Basic data taken from Poats "Cattle Hide and Shoe Price" MTS 186, August, 1972.

# IV. PRICING

The price for hides (and skins) is based primarily on the derived demand resulting from the demand for finished leather used in the manufacture of shoes. Supply is based on the number of cattle slaughtered both domestically and in other hide exporting countries such as Argentina, Brazil and Australia but the number of cattle slaughtered is in no way related to the demand for hides. Continued strong demand for hides on the world market, a sharp drop in Argentina's exports and discontinued U. S. production of two major synthetic substitutes in 1971 caused prices of cattle hides to more than double between August, 1971 and June, 1972

## A. Price Determination

### 1. Demand for Leather

The demand for leather is strongly influenced by the number of shoes produced in the United States. Table IV-1 indicates that 78 percent of the cattle hides produced in the U. S. in 1970 was used for the production of shoes. However, to obtain a clearer picture of total demand, several other factors must be considered.

First, there has been a market substitution of synthetics for leather. In 1971 the Bureau of Census reported that 66.9 percent of all shoes domestically manufactured had all leather uppers. The comparable ratio for May, 1973 is 56.5 percent. This substitution appears to have been related to the increase in prices of hides which occurred during that time. According to the Tanners' Council this change was the primary result of rigid price grooves existing in the shoe manufacturing and retailing structure rather than a shift in consumer preference. Both the manufacturers and the retailers are reluctant to alter price levels once a seasons style showings have been made.

Change in components of the shoe is the most generally used method of holding the price line -- and in the recent case an increased use in synthetics. This occurred in spite of the fact that two major U. S. producers of synthetics discontinued production. This argument can be strengthened by observing the historic factory value per pair of shoes (Appendix Table A-3). Prices for shoes has been increasing at a steady rate of about 5 percent per year. In 1969 the average factory value for a pair of shoes was $4.94, by 1972 the price had increased to $5.56, an increase of 12.5 percent. During the same time cattle hide prices more than doubled. This would tend to slightly overstate the case; however, recognizing the time lag involved between hide and leather price changes and leather price and finished shoe construction.

The progress made in synthetic technology during the recent years presents a particular dangerous threat to further erosion of the domestic leather market.

U. S. shoe manufacturers have also felt the impact of imported shoes. Domestic shoe production reached a peak in 1968 when 642 million pairs were produced. This has since declined to 526 million pairs in 1972 with a corresponding increase in the imports of shoes from 175 million in 1967 to 296 million pairs in 1972 or 36 percent of the total shoes sold in the U. S. (see Appendix Table A-4).

The market for raw hides is greatly influenced by international trends. Europe and Japan are the traditional importers of raw hides, but Eastern Block countries such as Rumania and Czechoslovakia have recently increased hide imports from the U.S. (Appendix Table A-10). The Argentine has traditionally been a large exporter of hides with an average of 8-8.5 million hides from 1966 through 1969. Exports began to decline slightly in 1970 then sharply in 1971 and amounted to only 1.3 million in 1972. This has been caused by their internal production problems and also an attempt to completely internalize their hide industry and eventually only export finish leather products. Brazil also internalized the hide tanning industry and banned exports of raw hides further reducing world supply by two million hides. This year Brazil has become an importer of raw hides and is now competing for raw hides on an international basis.

## 2. Supply of Raw Hides

Cattle numbers in the U. S. and throughout the world are in an upward trend. According to the Foreign Agricultural Service of the U. S. Department of Agriculture, world cattle inventory for 1973 is estimated at 1,299 million, with a comparable figure for 1964-1968 given as 1,184.6 million. Greater cattle numbers can be equated with greater annual slaughter and therefore hide supply (Appendix Table A-6). It appears however that the rate of growth in cattle inventories and potential slaughter does not match the growth in human population plus the elevation of living standards.

Table IV-1. Apparent U.S. equivalent cattle hide disappearance by major use

| Year | Hides used for shoes | | Hides used for gloves and garments | | Hides for other leather uses | | Net hide exports | | Total disappearance |
|---|---|---|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number |
| | 1,000 | | 1,000 | | 1,000 | | 1,000 | | 1,000 |
| 1960 | 25,142 | 80.9 | 3,484 | 11.2 | 2,001 | 6.5 | 440 | 1.4 | 31,067 |
| 1961 | 25,422 | 77.0 | 3,778 | 11.4 | 1,930 | 5.8 | 1,909 | 5.8 | 33,039 |
| 1962 | 24,991 | 79.2 | 3,459 | 10.9 | 1,961 | 6.2 | 1,155 | 3.7 | 31,566 |
| 1963 | 23,838 | 74.0 | 4,026 | 12.5 | 2,177 | 6.8 | 2,160 | 6.7 | 32,201 |
| 1964 | 24,929 | 68.7 | 3,772 | 10.4 | 2,195 | 6.1 | 5,388 | 14.8 | 36,284 |
| 1965 | 25,351 | 65.2 | 3,855 | 9.9 | 2,246 | 5.8 | 7,419 | 19.1 | 38,871 |
| 1966 | 25,131 | 62.1 | 3,881 | 9.6 | 2,153 | 5.3 | 9,316 | 23.0 | 40,481 |
| 1967 | 23,894 | 62.0 | 3,940 | 10.2 | 1,982 | 5.2 | 8,700 | 22.6 | 38,516 |
| 1968 | 24,151 | 62.4 | 4,566 | 11.8 | 2,111 | 5.5 | 7,842 | 20.3 | 38,670 |
| 1969 | 21,568 | 55.2 | 3,825 | 9.8 | 2,096 | 5.4 | 11,580 | 29.6 | 39,069 |
| 1970 | 19,551 | 51.9 | 3,790 | 10.1 | 1,833 | 4.9 | 12,462 | 33.1 | 37,636 |
| 1971 | | | | | | | | | |
| 1972 | | | | | | | | | |

Source: Livestock Marketing Situation - 182, November, 1971.
Data on leather production from cattle hides, calf skins, sheep skins and goat skins and net exports of raw skins from Tanners Council of America converted to equivalent cattle hides.

Table IV-2 presents breakdown of cattle slaughter in the United States from 1955 through 1972. The sharp increase in cattle numbers can be attributed to the feedlot system of producing beef and the increased diversion of calves slaughtered for veal to the feedlots. Even dairy calves are now used for beef production instead of being retained for milk herds or slaughtered as veal. This is reflected in Table IV-3. Calfskins and kipskins tanned in the U. S. have decreased from 10 million in 1955 to about 1.5 million in 1972.

The spectacular growth of U. S. cattle slaughter in the past two decades will not be duplicated in the future, many experts believe. This is because many ranges used for the production of feeder calves are operating at close to capacity and further expansion of herds must come from technological innovations and expansion of marginal production areas heretofore not fully utilized. Future growth in the cattle industry will come at a slower rate.

Supplies of other types of leather making raw material do not show the same trend as cattlehides. Calfskin supplies have and are shrinking drastically throughout the world. Goatskin supplies are limited and declining because more intensive and modern agriculture is inimical to the maintenance of goat herds. India, of course, is the great exception to the latter trend for religious reasons. However, the Indian supply of goatskins has increasingly been sequestered for domestic use by government restriction and regulation so that supply available to the U. S. tanners has become negligible. Sheep and lambskin supply is influenced by price developments in meat and in wool. Although flocks in the U. S. have steadily declined for 22 years, world numbers have increased slightly due to growth in Australia and New Zealand. Competition from other hide importing countries for the available supply of sheepskins and lambskins has increased.

In summary, the tanning industry of the United States is increasingly based on cattlehides as its raw material. International competition will most likely continue to place severe pressure on the industry as world demand for U. S. produced hides increases and as the production of other leather continues to decline.

## 3. Pricing in the Leather Industry

The price basis for tanned and finished leather is the price of raw (salt or brine cured) hides at the packing house. The raw hide price (for cattle hides) is a published price and commonly known throughout the trade on a day to day basis. Tanners -- both domestic and foreign -- purchase the

Table IV-2. Cattle slaughter in the United States, 1955-1972
(1,000 head)

| | Breakdown of Federal Inspected Slaughter | | | | | | | Total Commercial Slaughter |
|---|---|---|---|---|---|---|---|---|
| | Cows & Heifers | % Total | Steers | % Total | Bulls & Stags | % Total | Total F.I.S. | |
| | | | | ANNUAL TOTALS | | | | |
| 1955 | 9,330 | 48.9 | 9,299 | 48.8 | 427 | 2.3 | 19,056 | 25,723 |
| 1956 | 9,460 | 46.9 | 10,311 | 51.1 | 415 | 2.0 | 20,186 | 26,862 |
| 1957 | 9,031 | 46.4 | 10,018 | 51.5 | 404 | 2.1 | 19,453 | 26,232 |
| 1958 | 7,509 | 42.6 | 9,840 | 55.8 | 293 | 1.6 | 17,642 | 23,555 |
| 1959 | 7,538 | 43.2 | 9,681 | 55.4 | 241 | 1.4 | 17,460 | 22,931 |
| 1960 | 8,567 | 44.2 | 10,557 | 54.4 | 272 | 1.4 | 19,396 | 25,224 |
| 1961 | 8,554 | 42.8 | 11,164 | 55.9 | 250 | 1.3 | 19,968 | 25,635 |
| 1962 | 8,670 | 42.6 | 11,447 | 56.3 | 222 | 1.1 | 20,339 | 26,083 |
| 1963 | 8,964 | 41.4 | 12,496 | 57.7 | 202 | 0.9 | 21,662 | 27,231 |
| 1964 | 10,452 | 41.6 | 14,395 | 57.3 | 286 | 1.1 | 25,133 | 30,818 |
| 1965 | 12,712 | 47.8 | 13,488 | 50.7 | 413 | 1.5 | 26,613 | 32,347 |
| 1966 | 13,055 | 47.8 | 13,846 | 50.7 | 418 | 1.5 | 27,319 | 33,725 |
| 1967 | 12,710 | 45.8 | 14,676 | 52.8 | 384 | 1.4 | 27,780 | 33,869 |
| 1968 | 13,771 | 46.5 | 15,361 | 51.9 | 460 | 1.6 | 29,592 | 35,026 |
| 1969 | 14,284 | 46.8 | 15,754 | 51.6 | 499 | 1.6 | 30,537 | 35,237 |
| 1970 | 13,677 | 44.4 | 16,608 | 53.9 | 508 | 1.7 | 30,793 | 35,025 |
| 1971 | 13,856 | 44.1 | 17,003 | 54.1 | 560 | 1.8 | 31,419 | 35,585 |
| 1972 | 13,932 | 43.2 | 17,737 | 55.0 | 581 | 1.8 | 32,250 | 35,774 |

Source: Tanners' Council of America, Inc.

Table IV-3. Total hides and skins tanned in the United States, 1955-1972 (000)

| Year | Cattlehides | Calfskins and kipskins | Sheep and lamb skins | Goat and kid skins | Total hides and skins | Cattlehide equivalent |
|---|---|---|---|---|---|---|
| 1955 | 25,537 | 10,234 | 24,006 | 26,109 | 85,886 | |
| 1956 | 26,441 | 8,346 | 24,713 | 25,103 | 84,603 | |
| 1957 | 24,924 | 9,074 | 23,527 | 22,336 | 79,861 | |
| 1958 | 23,690 | 7,648 | 25,550 | 19,992 | 76,880 | |
| 1959 | 22,606 | 6,394 | 29,753 | 22,797 | 81,550 | |
| 1960 | 22,044 | 6,407 | 28,321 | 18,835 | 75,607 | |
| 1961 | 22,271 | 6,488 | 29,627 | 14,865 | 73,251 | 31,818 |
| 1962 | 22,585 | 5,757 | 27,697 | 14,213 | 70,252 | 31,414 |
| 1963 | 21,815 | 5,851 | 21,292 | 14,182 | 63,140 | 31,342 |
| 1964 | 22,799 | 6,663 | 28,908 | 12,874 | 71,244 | 32,003 |
| 1965 | 23,241 | 5,745 | 27,786 | 14,557 | 71,326 | 32,364 |
| 1966 | 23,572 | 4,275 | 26,897 | 13,372 | 68,116 | 31,749 |
| 1967 | 23,607 | 4,059 | 26,180 | 8,456 | 62,302 | 30,771 |
| 1968 | 23,617 | 3,854 | 29,328 | 6,764 | 63,563 | 31,740 |
| 1969 | 21,096 | 3,390 | 23,297 | 5,856 | 53,639 | 27,633 |
| 1970 | 20,199 | 2,425 | 21,868 | 3,979 | 48,471 | 25,520 |
| 1971 | 20,189 | 1,120 | 19,895 | 3,148 | 44,352 | 24,993 |
| 1972 | 19,218 | 1,491 | 18,781 | 3,522 | 43,012 | 23,964 |

Source: Tanners Council of America, Inc.

available supply of hides from packers in a relatively open and competitive market. The one basic price (with exception of course for grade and type) prevails throughout the industry and is established on the basis of supply and demand.

A unique feature of this market is that it is strictly a by-product market. The demand for hides in no way affects the supply of cattle moving to market. For example, the value of a hide represents approximately 5 percent of the current value of a 1,000 pound market steer. Ten years ago when hide prices were considerably lower, it represented approximately 4.4 percent of the value. Even with the present high hide prices the demand for hides has a negligible effect on the supply of cattle.

The finished leather price -- with a constant margin for tanning and finishing -- follows the course of hide and skin prices. There is a frictional lag on finished leather when hide prices move up and a lag of shorter duration as hide prices move down as knowledgeable customers immediately request the benefit of lower raw material costs. The price for finished leather is not published, however, due to the many types of finishing that can be applied. Further, approximately 60 percent of the finished leather is sold under contract.

Although there are no definitive studies available regarding pricing in the leather tanning industry, some general conclusions can be drawn.

1. Hide and skin prices are widely quoted and well-known to the industry -- both domestic and international.

2. Leather tanning and finishing is a chemical processing industry in which continuity of operation is desirable and interruption is costly in terms of overhead or fixed costs as well as start up time.

3. Very few operations can be automated to any significant degree. Tanning is a batch processing industry in which the hides must be handled individually at various key stages. Therefore, a large tannery consists of multiples of a smaller plant without major economies of scale in production.

4. **Standard costs for leather tanning and finishing in the industry are well-known. Therefore, the market value of finished product follows the price of raw material with a relatively uniform margin for processing.**

5. **The industry is very competitive and is underutilizing its present capacity.**

6. **In an industry that is predominantly family-owned, financial considerations are frequently less important in operating or management motivation than the perquisites of ownership, obligation to associates, employees and community.**

## B. International Trade

**Forces arising from international trade have continued to play an important role in the operations of the domestic leather tanning and finishing industry and its prices. Reference is made here to (1) the tremendous increase in the imports of shoes into the United States during the past ten years, and (2) the parallel sharp rise in the exports of cattlehides from the United States. The following comparison indicates the magnitude of the change that has occurred in the past decade.**

| | U.S. Shoe Imports (000 Pairs) | U. S. Net Hide Exports (000 Hides) |
|---|---|---|
| 1962 | 55,057 | 6,708 |
| 1972 | 296,865 | 17,303 |

**In terms of dollar value, Table IV-4 shows the great disparity in the value of hides exported in 1971 compared with the value of leather manufacturers and footwear -- $156 versus $873 million. In 1972 the value of imported shoes and leather manufacturers amounted to nearly 1.2 billion dollars. Apparently much of the raw material exported from the United States is the exact equivalent of the finished goods, shoes and other leather products returning to the United States, from low wage countries.**

Table IV-4. Summary of value of imports and exports for hides and skins, fur skin, leather manufacturer and dressed fur and footwear 1960 - 1972 (million dollars)

| | 1960 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Imports | | | | |
| Hides and skins except furs | 70 | 80 | 89 | 61 | 78 | 62 | 51 | 52 | |
| Fur skins, undressed | 96 | 113 | 126 | 92 | 103 | 94 | 59 | 53 | |
| Leather manufacturer dressed furs | 52 | 87 | 103 | 89 | 114 | 123 | 118 | 115 | 334 |
| Footwear | 148 | 160 | 190 | 263 | 388 | 488 | 629 | 758 | 835 |
| Total leather and footwear | 200 | 247 | 293 | 352 | 502 | 611 | 747 | 873 | 1169 |
| | | | | | Exports | | | | |
| Hides and skins, except fur skin | 76 | 109 | 155 | 128 | 122 | 152 | 145 | 156 | |

Source: Statistical Abstract of the United States, 1972; 1972 data from Tanners' Council of America.

It is believed the primary reason for the huge exports of raw material and importation of finished product -- a characteristic of developing nations -- is the differential in labor base. Discussions with knowledgeable individuals indicate that the level of technology in the production of shoes is universally-based with no country enjoying a competitive edge. Thus, labor costs appear to be the key factor.

# V. ECONOMIC IMPACT ANALYSIS METHODOLOGY

The following economic impact analysis utilizes the basic industry information developed in Chapters I-IV plus the pollution abatement technology and costs provided by Environmental Protection Agency. The impacts examined include:

Price effects
Financial effects
Production effects
Employment effects
Community effects
Other effects

The impact analysis will not be a simple sequencial analysis but rather will be composed of a number of interacting steps. The schematic of the analytical approach is shown in Exhibit V-1. Because of the fundamental importance of potential plant shutdowns (financial and production effects) relative to the other impacts, a disproportionate amount of time will be devoted to the plant closure analysis.

The fundamental aspect of the impact analysis is similar to that normally done for any capital budgeting study of new investments. Simply stated, the problem is one of deciding whether a commitment of time or money to a project is worthwhile in terms of the expected benefits derived. The decision in this case is complicated by the fact that benefits will accrue over a period of time and that in actuality no analyst is sufficiently clairvoyant or physically able to reflect upon all of the required cost and benefit analysis information which relates to projections of the future. In the face of imperfect and incomplete information, the industry segments were reduced to money relationships insofar as possible and the key non-quantifiable factors were incorporated into the analysis to modify the quantified data. The latter process is particularly important in view of the use of model plants in the financial analysis. In practice, actual plants will differ from the model, and these differences must necessarily be considered in any interpretation of analytic data reflecting the behavior of model plants.

## A. Fundamental Methodology

Much of the underlying analysis regarding price, financial, and production effects is applicable to all other impact effects. Consequently, the case methodology described here is conceptually integrated and the specific impact interpretations are discussed under their appropriate headings.

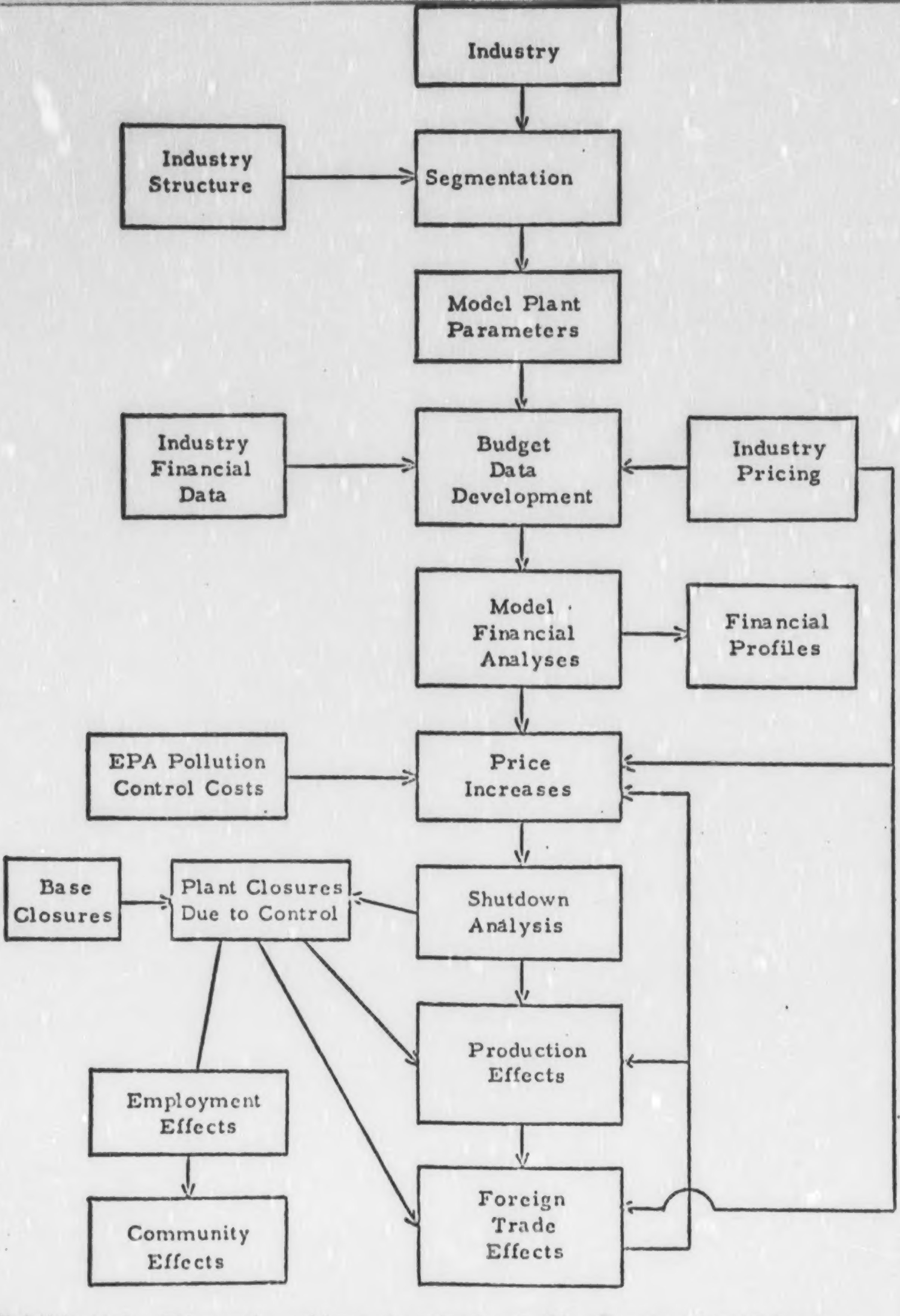
Industry
Industry Structure
Segmentation
Model Plant Parameters
Industry Financial Data
Budget Data Development
Industry Pricing
Model Financial Analyses
Financial Profiles
EPA Pollution Control Costs
Price Increases
Base Closures
Plant Closures Due to Control
Shutdown Analysis
Production Effects
Employment Effects
Community Effects
Foreign Trade Effects

Exhibit V-1. Schematic of impact analysis of effluent control guidelines.

The core conceptual data used in this analysis are the physical and financial characteristics of the various industry segments as projected on the basis of model plants. The estimated cash flows for these model plants are summarized in Chapter III.

The primary factors involved in assessing the financial and production impact of pollution control are profitability changes; and these, in turn, are a function of the cost of pollution control and the ability to pass along these costs in higher prices. In reality, of course, closure decisions are seldom made on the basis of well defined common economic rules; such decisions invariably include a wide range of personal values, external forces such as the ability to obtain financing, or the role of the production unit in an integrated larger cost center. Such non-economic variables include but are not limited to the following conditions and are generally characteristic of proprietorships and closely held enterprises rather than publicly held corporations.

1. Production units may lack sufficient financial accounting data. This is especially likely to occur among small, independent operators who do not have effective cost accounting systems.

2. Production units may be so old and fully depreciated that management has no intention of replacing or modernizing them. Production continues only so long as it covers labor and materials costs and/or until the equipment becomes inoperative.

3. Marginally productive units may be acquired by new ownership that can reevaluate existing assets or that can absorb temporary low returns with the expectation of eventual acceptable profit returns.

4. Production unit ownership may have value as psychic income. Such ownership, may answer personal values that are great enough to override rational economic decisions.

5. The production unit, if part of a larger economic entity, may (1) use raw materials produced in another plant within the firm that must have an assured market or (2) supply intermediate products to another unit within the firm. When the profitability of the second operation offsets the losses in the first plant, the unprofitable operation may continue indefinitely because the total enterprise is profitable.

6. The owner-operator expects that adverse conditions and consequent losses are temporary. His ability to absorb short-term losses depends upon his access to funds through credit or personal resources not presently utilized.

7. There are very low (approaching zero) opportunity costs for the fixed assets and for the owner-operator's managerial skills and/or labor. As long as the operator can meet labor and materials costs, he will continue to operate. He may even operate with gross revenues below variable costs until he has exhausted his working capital and credit.

8. The value of the land on which the plant is located is appreciating at a rate sufficient to offset short-term losses; funds are available to meet operating needs and opportunity costs of the owner-operator's managerial skills are low.

While these factors are present in and relevant to business decisions, it is argued that common economic rules are sufficient to provide useful and reliable insight into potential business responses to required investment and operating costs in pollution control facilities.

The following discussion presumes investment in pollution control facilities. However, the rules presented apply to on-going operations. In the simplest case, a plant will be closed when variable expenses (Vc) are greater than revenues (R) since by closing the plant, losses can be avoided.

A more probable situation is where $VC<R$ but revenues are less than variable costs plus cash overhead expenses (TCc) which are fixed in the short run. In this situation a plant would likely continue to operate as contributions are being made toward covering a portion of these fixed cash overhead expenses. The firm cannot operate indefinitely under this condition, but the length of this period is uncertain. Basic to this strategy of continuing operations is the firm's expectation that revenues will increase to cover cash outlay. Identification of plants where $TCc > R$, but $Vc < R$ leads to an estimate of plants that should be closed over some period of time if revenues do not increase. However, the timing of such closures is difficult to predict.

The next level is where $TCc< R$. So long as $TCc< R$ it is likely that plant operations will continue so long as the capitalized value of earnings (CV), at the firm's (industry) cost of capital, is greater than the realiable value (S) of sunk plant investment. If $S > CV$ or $CV - S > O$, the firm could realize S in cash and reinvest and be financially better off, assuming reinvesting at least at the firm's (industry) cost of capital.

Computation of CV involves discounting the future earning flows to present value through the discounting function:

$$NPV = \sum_{n=1}^{t} A_n (1+i)^{-n}$$

where

$NPV$ = net present value
$A_n$ = future after-tax income in nth year or salvage value in year t
$i$ = discount rate at cost of capital
$n$ = number of conversion periods, i.e., 1 year, 2 years, etc.

It should be noted that a more common measure of profitability is return on investment (ROI) where profits are expressed as a percent of invested capital (book value), net worth or sales. These measures should not be viewed so much as different estimates of profitability as compared to present value measures but rather an entirely different profitability concept.

The data requirements for ROI and NPV measures are derived from the same basic financial information although the final inputs are handled differently for each.

## 1. Returns

For purposes of this analysis, returns for the ROI analysis have been defined as pre-tax and after-tax income and for the NPV analysis after-tax cash proceeds. The computation of each is shown below:

Pre-tax income = $(R-E-I-D)$

After-tax income = $(1 - T) \times (R - E - I - D)$

where

$T$ = tax rate

$R$ = revenues

$E$ = expenses other than depreciation and interest

$I$ = interest expense

$D$ = depreciation charges

Interest in the cash proceeds computation is omitted since it is reflected in the discount rate, which is the after-tax cost of capital. Depreciation is included in the NPV measure only in terms of its tax effect and is then added back to obtain cash flow.

A tax rate of 22 percent on the first $25,000 income and 48 percent on amounts over $25,000 was used throughout the analysis. Accelerated depreciation methods, investment credits, carry forward and carry back provisions were not used due to their complexity and special limitations.

## 2. Investment

Investment is normally thought of as outlays for fixed assets and working capital. However, in evaluating closure of an on-going plant with sunk investment, the value of that investment is it's liquidation or salvage value (opportunity cost or shadow price). 1/ For this analysis, sunk investment was taken as the sum of liquidation value of fixed assets plus net working capital (current assets less current liabilities) tied up by the plant (see Chapter II for values). This same amount was taken as a negative investment in the terminal year.

The rationale for using total shadow priced investment was that the cash flows do not include interest expenses with interest charges reflected in the weighted cost of capital. This procedure requires the use of total capital (salvage value) regardless of source. An alternative would be to use as investment, net cash realization (total less debt retirement) upon liquidation of the plant. (In the single plant firm debt retirement would

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1/ This should not be confused with a simple buy-sell situation which merely involves a transfer of ownership from one firm to another. In this instance, the opportunity cost (shadow price) of the investment may take on a different value.

be clearly defined. In the case of the multi-plant firm, delineation of debt by plant would likely not be clear. Presumably this could be reflected in proportioning total debt to the individual plant on some plant parameter such as capacity or sales.) Under this latter procedure, interest and debt retirement costs would be included in the cash flows.

The two procedures will yield similar results if the cost of capital and interest charges are estimated on a similar basis. The former procedure, total salvage value, was used as it gives reasonable answers and simplifies both computation and explanation of the cash flows and salvage values.

Replacement investment for plant maintenance was taken as equal to annual depreciation, which corresponds to operating policies of some managements and serves as a good proxy for replacement in an on-going business.

Investment in pollution control facilities will be from estimates provided by EPA. Only incremental values will be used, to reflect in-place facilities and only the value of the land for control will be taken as a negative investment in the terminal year, i.e., pollution control equipment is assumed to have no salvage value.

The above discussion refers primarily to the NPV analysis. Investment used in estimating ROI was taken as invested capital--book value of assets plus net working capital.

### 3. Cost of Capital - After Tax

Return on invested capital is a fundamental notion in U. S. business. It provides both a measure of a firm's actual performance as well as its expected performance. In the latter case, it is also called the cost of capital. In this analysis the cost of capital is defined as the weighted average of the cost of each type of capital employed by the firm, generally its equities and interest bearing liabilities. There is no methodology that yields the precise cost of capital, but the cost can be approximated within reasonable bounds.

The cost of capital was determined for purposes of this study by examining Troy's Financial Almanac and industry provided data. The weights of the two respective types capital were estimated at 60 percent debt and 40 percent equity. The cost of debt was assumed to be 8 percent. The cost of equity was determined from the ratio of before tax income to net worth and estimated at 21.6 percent.

To determine the weighted average cost of capital, it is necessary to adjust the before tax costs to after tax costs. This is done by multiplying the costs by one minus the tax rate (assumed to be 48 percent, the marginal federal income tax rate).

Weighted Average Cost of Capital

| Item | Weight | Before tax cost | Tax Rate | After tax cost | Weighted cost |
|---|---|---|---|---|---|
| Debt | .60 | .08 | .48 | .0416 | .025 |
| Equity | .40 | .216 | .48 | .1123 | .045 |
| | | | | | .070 |

As shown in the above computation, the estimated after tax cost of capital is 7.0 percent. (The before tax costs were compiled from several sources and are assumed to be representative of the industry.)

## 4. Construction of the Cash Flow

The cash flow to be used in the analysis of BPT (Best Practicable Technology) and BAT (Best Available Technology) effluent control and will be constructed as follows:

1. Sunk investment (salvage market value of fixed assets plus net working capital) taken in year $t_o$, assumed to be equivalent to 1976
2. After tax cash proceeds taken for years $t_1$ to $t_n$
3. Annual replacement investment, equal to annual current depreciation taken for years $t_1$ to $t_n$.
4. Terminal value equal to sunk investment taken in year $t_n$.
5. Incremental pollution control investment taken in year $t_o$ for 1977 standards and year $t_6$ for 1983 standards.
6. Incremental pollution expenses taken for years $t_1$ to $t_n$ for 1977 standards and years $t_7$ to $t_n$ for 1983 standards if additive to the 1977 standards.
7. Replacement investment taken in year $t_n$ on incremental pollution investment in BPT on assumption of life of facilities as provided by EPA.

8. No terminal value of pollution facilities to be taken in year $t_n$. Land value will probably be assumed to be very small and/or zero, unless the costs provided indicate otherwise.

The length of the cash flow will depend upon the life of the pollution control technology provided by EPA. It is anticipated that the length of the cash flow will be equal to the life of control equipment specified for 1983 installation.

Construction of the cash flows for analyzing new source standards will be similar to BPT and BAT, excepting plant investments, costs and returns will be based on current values as if being built now.

## B. Price Effects

As shown in Figure V-1, price and production effects are interrelated with each having an impact upon the other. In fact, the very basis of price analysis is the premise that prices and supplies (production) are functionally related variables which are simultaneously resolved, thus the feedback loop shown in Figure V-1.

Solution of this requires knowledge of demand growth, price elasticities, supply elasticities, the degree to which regional markets exist, the degree of dominance exerted by large firms in the industry, market concentration exhibited by both the industry's suppliers of inputs and purchasers of outputs, organization and coordination within the industry, relationship of domestic output with the world market, existence and nature of complementary goods, cyclical trends in the industry, current utilization of capacity and, exogenous influences upon price determination (e.g., governmental regulation).

In view of the complexity and diversity of factors involved in determination of the market price, a purely quantitative approach to the problem of price effects will not be feasible for this study. Hence, the simultaneous considerations suggested above will be made. The judgment factor will be heavily employed in determining the supply response to a price change and alternative price changes to be employed.

As a guide to the analysis of price effects, the estimated required price increase to leave the model plant as well off after the investment in pollution control facilities as before, will be computed. The required price increase can be readily computed using the NPV analysis described above, but dealing only with the incremental pollution cash flow and sales.

Application of the above NPV procedure to pollution control costs will yield the present value of pollution control costs (i.e., investment plus operating cost less tax savings excluding interest expenses). Given this, the price increase required to pay for pollution control can be calculated as

$$P = \frac{(PVP)(100)}{(1-T)(PVR)}$$

where:

P = required percentage increase in price

PVP = present value of pollution control costs

PVR = present value of gross revenue (sales) starting in the year pollution control is imposed

T = tax rate appropriate following imposition of pollution control

The next step would be to evaluate the required price increases against expectations regarding the ability to raise prices. As pointed out above, this will be a function of a number of factors. In cases where a few large plants represent the bulk of production, their required price increase will likely set the upper limit. For the products in this study, other factors will be overriding. These include expected price changes for basic fertilizer materials due to future supply-demand conditions and impacts such as pollution control, as well as the declining consumption of these products per se. From this analysis, which will be quantitative, an initial estimate of expected price increases would be made.

Following this, the initial shutdown analysis (production curtailment) will be made. The decrease in production will be evaluated in light of impact on prices and if warranted by production decreases, the expected price increase would be revised upward.

## C. Shutdown Analysis

The basic shutdown analysis would be based upon the technique described above under Section A and the expected price increase from the preceding step.

Based on the results of the NPV analysis of model plants, likely closures would be identified where NPV < O. Segments or plants in the industry would be equated to the appropriate model (on interpolation) results. Mitigating items, such as association with a complex, captive raw material sources, unique market advantages and existing in place controls and ability to finance new non-productive investment would be factored in quantitatively to obtain an estimate of likely closures. If BAT costs differ from BPT costs, closure estimates would be required for each condition. It is recognized that the use of model plants to represent an industry is imperfect and that not all of the relevant factors can be included in the models. In other words, for any given model plant one would expect to find some actual plants with profits lower and some higher than shown for the model plant. In a statistical sense, one can describe this phenomenon via distribution functions. By examining various financial publications, the standard deviation of net profit as a percent of sales can be estimated or approximated.

The methodology employed implicitly assumes that the model plant represents the median plant for the distribution and that there will be a different standard deviation for each plant.

Furthermore, the procedure implies that the standard deviation will be larger for the more profitable industry segments. By utilizing the net present values calculated under alternative effluent treatment assumptions, the standard deviations described above, and the assumptions that plants with a negative net present value will be forced to close, the percentage of firms closing in each industry segment can be readily estimated through accepted statistical techniques.

The impact of these closures would be evaluated as the next step (see Figure V-1). If production impacts were of sufficient magnitude, the expected prices would be re-evaluated and the shutdown analysis is repeated.

## D. Production Effects

Potential production effects include changes of capacity utilization rates, plant closures and stagnation of industry growth. Plant closures may be offset in total or in part by increases in capacity utilization on the part of plants remaining in operation. Expected new production facilities would be estimated. The end result would be estimated production under the conditions presumed for the above closure analysis.

The estimated production under these expectations would feed back into the price analysis to verify or revise expected price changes.

## E. Employment Effects

Given the production effects of estimated production curtailments, potential plant closings and changes in industry growth, a major consideration arises in the implications of these factors upon employment in the industry. The employment effects stemming from each of these production impacts in terms of jobs lost will be estimated using the model plant information.

To the extent possible,the location of closed plants, the major employee classification involved and potential for re-employment will be evaluated.

## F. Community Effects

The direct impacts of job losses upon a community are immediately apparent. However, in many cases, plant closures and cutbacks have a far greater impact than just the employment loss. These multiplier effects will be reflected in evaluating payroll losses and income multipliers.

## G. Other Effects

Other impacts such as direct balance of payments effects will also be included in the analysis. This will involve qualitative analyses.

# VI. POLLUTION CONTROL REQUIREMENTS AND COSTS

Water pollution control requirements and costs used in this analysis were furnished by the Effluent Guidelines Division of the Environmental Protection Agency from materials developed by Stanley Consultants, Inc.[1] These basic data covered seven categories of plants in the leather tanning and finishing industry, and this information was adapted to the types and sizes of tanning plants specified in this analysis.

Four effluent control levels were considered in the information provided:

| | | |
|---|---|---|
| (I) BPT | - | Best Practicable Control Technology Currently Available, to be achieved by July 1, 1977 |
| (II) BAT | - | Best Available Pollution Control Technology Economically Achievable, to be achieved by July 1, 1983 |
| (III) NSPS | - | New Source Performance Standards, apply to any source for which construction starts after the publication of the proposed regulations for the Standards |
| (IV) Pretreatment | - | Pretreatment Requirements, pretreatment of effluent required for discharge in publicly-owned wastewater treatment plants. |

## A. Categories of Leather Tanning and Finishing Plants

The information furnished by EPA in the Development Document provided a categorization system to classify plants into major categories. Seven major categories of plants were proposed for the purposes of evaluating control and treatment technology. Each category represents a common manufacturing procedure in terms of three primary processes: beamhouse, tanning and finishing. These seven categories of plants, in terms of the types of primary processes used, are as follows:

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[1] Development Document for Effluent Limitations Guidelines and Standards of Performance -- Leather Tanning and Finishing Industry, Draft Report, Stanley Consultants, Inc., June, 1973.

**Industry Categories**

| | Primary Processes | | |
|---|---|---|---|
| **Category** | **Beamhouse** | **Tanning** | **Finishing** |
| 1 | Pulp Hair | Chrome | Yes |
| 2 | Save Hair | Chrome | Yes |
| 3 | Save Hair | Vegetable | Yes |
| 4 | Hair Previously Removed | Previously Tanned | Yes |
| 5 | Hair Previously Removed or Retained | Chrome | Yes |
| 6 | Pulp Hair | Chrome | No |
| 7 | Hide Curing | No Tanning | No |

The above categories of plants were evaluated separately from the standpoint of establishing effluent limitation guidelines which are described next.

## B. Effluent Limitation Guidelines

*The Development Document* specified the degree of effluent reduction attainable through application of the Best Practicable Control Technology Currently Available. These BPT effluent limitations are shown in Table VI-1.

As discussed later, the proposed treatment practices required to achieve the effluent limitation levels are essentially the same for categories 1 to 6. Thus, the effluent limitations are varied because of different wasteflow characteristics of various processes rather than differences in treatment strategy. Category 7 (hide curing) has very little wasteflows and either evaporation techniques or primary settling prior to municipal discharge is recommended to achieve zero discharge.

*The Development Document* also allows additional limitations for small plants and some medium sized plants to meet the BPT standards. Accordingly, additional allocations equal to one half the effluent limitations guidelines for $BOD_5$ and TSS are allowed tanners with a production less than 17,000 kg hide per day (37,490 pounds) or approximately 800 hides per day. The Effluent Limitations for plants of less than 800 hides per day are consistent with plants of larger size for the BAT standards.

Table VI-1. Best practicable effluent limitations (BPT) maximum thirty day average (July 1, 1977)

| Parameter[1/] | Subcategory<br>kg/1000 kg hide (lb/1000 lb hide)<br>1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $BOD_5$ | 4.0 | 4.6 | 3.8 | 1.6 | 4.8 | 2.8 |
| Total Chromium | 0.10 | 0.12 | 0.05 | 0,10 | 0.06 | 0.10 |
| Oil and grease | 0.75 | 0.90 | 0.75 | 0.25 | 0.90 | 0.35 |
| TSS | 5.0 | 5.8 | 4.8 | 2.0 | 6.0 | 3.4 |

[1/] For all subcategories pH should range between 6.0 and 9.0 at any time.

Source: Revised Development Document, March 1974.

The Best Practicable Effluent Limitations (BPT) for the leather tanning and finishing industry are shown in Table VI-2. This limitation level is principally an extension of the best practicable control technology currently available requirements to provide for additional removals of BOD and SS as well as sulfide and nitrogen removal.

The new source standards (NSPS) are said to be the same as BPT and BAT for 1977 and 1983, respectively. Also, separate pretreatment standards were proposed for this industry for selected pollutants (e.g., chromium, oil and grease, sulfide, and, also pH control). These guidelines are not repeated herein, but the proposed control methods and control costs are evaluated subsequently.

## C. Pollution Control Requirements

To achieve the effluent limitations proposed above, the leather tanning and finishing industry will be required to apply rather extensive waste treatment practices. A summary of treatment practices expected to be necessary to achieve both the BPT and BAT guidelines are presented below.

### I. Best Practicable Control Technology Currently Available (BPT)

A series of treatment steps are generally expected to be required in the leather tanning industry to meet the proposed BPT guidelines. Based upon the best practicable control technology currently available, the following principal control and treatment operations are generally needed to meet the BPT limitations:

1. Recycle of chrome and vegetable tan solutions (not in categories 3 and 4).
2. Fine screening.
3. Equalization to dampen quality and quantity fluctuations which will impair subsequent processes, particularly biological units.
4. Primary settling to provide oil and grease separation, precipitate chromium from rinse waters, and partially remove $BOD_5$, COD, and suspended solids.

Table VI-2. Best available effluent limitations (BAT)
(July 1, 1983)

| Parameters [1] | Subcategory<br>kg/1,000 kg hide (lb/1,000 lb hide)<br>1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $BOD_5$ | 1.40 | 1.60 | 1.30 | 0.50 | 1.60 | 0.70 |
| Total Chromium | 0.05 | 0.06 | 0.05 | 0.02 | 0.06 | 0.03 |
| Oil and Grease | 0.53 | 0.63 | 0.50 | 0.24 | 0.63 | 0.34 |
| Sulfide | 0.005 | 0.006 | 0.005 | 0.002 | 0.006 | 0.003 |
| Suspended Solids | 1.5 | 1.8 | 1.4 | 0.6 | 1.8 | 0.8 |
| Total Kjeldahl Nitrogen | 0.27 | 0.32 | 0.25 | 0.10 | 0.31 | 0.14 |

[1] For all categories pH should range between 6.0 and 9.0 at any time.

For all subcategories Most Probable Number (MPN) of Fecal Coliforms should not exceed 400 counts per 100 ml.

Source: Revised Development Document, March 1974.

5. Aeration and secondary settling to further reduce $BOD_5$, COD, and suspended solids.

6. Sludge handling (holding tank + on-site disposal).

This summary of treatment steps generally applies to Categories 1 through 6 as presented in the Development Document. Category 7 (hide curing, no tanning) generally involves very low waste flows. Thus, this segment will not be considered further in this analysis.

An outline description of the treatment strategy proposed to meet the BPT guidelines is as follows:

### Pretreatment and Activated Sludge

This strategy includes pumping, screening, equalization, and primary clarification. This is followed with an aeration basin, secondary clarifier, graded media filter and chlorination. Combined sludge handling includes holding tanks, thickening units, dewatering and landfill disposal.

## II. (BAT) - Best Available Technology Economically Achievable

The best available technology economically achievable for the leather tanning industry includes major removal of all nitrogen forms in addition to removal of those constituents accounted for in BPT. A general summary of the major steps required to achieve the BAT complete treatment guidelines is as follows:

1. Recycle of chrome and vegetable tanning solutions (where applicable).

2. Collection of beamhouse wastes containing sulfide; oxidation of sulfide using a catalyst such as manganous sulfate (not in categories 4 and 5).

3. Fine screening.

4. Equalization to dampen variations in quality and quantity which will impair subsequent processes, particularly biological units.

5. Aeration and clarification of solids to remove carbonaceous $BOD_5$, COD, and suspended solids.

6. Aeration to nitrify organic and ammonia nitrogen; mixing with a carbon source to cause denitrification; an aeration flume to assist nitrogen gas removal; and a final settling tank.

7. Filtration of the final effluent using deep-bed, mixed-media filters or similar devises for final suspended solids removal.

The treatment steps are again generally applicable for Category 1 to 6 types of plants as defined above. As indicated, selected in-plant modifications to reduce wasteflows and recycle process waters or solutions are regarded as essential.

An outline description of the treatment strategy proposed to meet the BAT guidelines is as follows:

### BAT: Pretreatment, Activated Sludge with Nitrification, and Denitrification

This strategy includes the treatment indicated above for BPT, plus the addition of a nitrification basin, settling tanks, covered denitrification basin, and aeration flume.

The proposed NSPS treatment requirements are said to be the same as BPT for 1977 and BAT for 1983. Pretreatment, if required, will generally involve major steps. In brief, items 1 to 4 and 6 of the BPT practices above are expected to be required, plus adjustment of pH prior to discharge of the municipal system.

## Pollution Control Costs

Pollution control costs estimates were provided by EPA for representative model plants in each of the seven leather tanning and finishing categories defined above. Also, within each category a series of alternative treatment practices were assessed (corresponding to the pretreatment, BPT, BAT, etc. requirements).

Based upon data available in Appendix A of the Development Document, DPRA generated additional investment and operating cost data as required for this study. In particular, data corresponding to different sizes of plants within category 1 were needed. A summary of estimated pollution control costs for various sizes of plants as used in this study are as shown in Table VI-3. Due to substantial easing of the requirements for BPT since the beginning of this study, these cost estimates may be somewhat on the high side; i.e., EPA's most recent easing of effluent standards did not result in a corresponding downward revision of cost estimates.

The estimated pollution control cost for the X-small, small and medium plants (up to approximately 800 hides per day) required to meet the revised BPT standards are shown in Table VI-3 also.

The method used to develop the cost data in Table VI-3 is partially illustrated by the curves or plotted graphs presented in Figure VI-1. These graphs reflect capital and O&M cost relationships for a particular type of tannery (Pulp hair - Chrome tan-Finish) and for a particular level of treatment (BAT). Similar relationships were derived from data provided for other major types of plants and alternative treatment levels. Data required for this study were taken from the graphs so developed.

It is noted that definite economies of scale in waste treatment were indicated in the data provided. Also, the cost functions for other types of plants and levels of treatment appeared similar in form to those illustrated in Figure VI-1.

## Status of Wastewater Treatment in the Industry

There are a declining number of plants in the leather tanning and finishing industry. There are 176 tanneries (wet process) in operation at the present time. In addition, there are an estimated 180 plants (essentially dry process) involving leather finishing operations only. These latter plants do not have significant wastewater effluent problems and are therefore excluded from further analysis in this study.

Waste treatment practices in the leather tanning and finishing (wet process) industry vary widely, ranging from no treatment (or only simple screening) to activated sludge systems. For those plants discharging directly into rivers or streams, waste treatment facilities are said to be severely lacking in the industry. No exemplary waste treatment plants handling only tannery wastes presently exist.

Table VI-3. Estimated pretreatment, BPT and BAT wastewater effluent treatment costs for selected types of plants in the leather tanning and finishing industry[1] (Pollution Control Costs 1972)

| Type of Plant (w/finishing) | Plant Size | Plant Data |  | Pretreatment |  | BPT |  | BAT |  |
|---|---|---|---|---|---|---|---|---|---|
|  |  | Hides/Day | MGD[2] | Capital[3] | O&M[4] | Capital | O&M | Capital | O&M |
|  |  |  |  | ($000) | ($000) | ($000) | ($000) | ($000) | ($000) |
| Pulp Hair - Chrome tan | X Small | 100 | .02 | 242 | 28 | 600 | 69 | 835 | 96 |
|  | Small | 300 | .06 | 291 | 33 | 950 | 109 | 1,250 | 144 |
|  | Medium | 700 | .14 | 377 | 43 | 1,175 | 135 | 1,580 | 182 |
|  | Large | 2,000 | .40 | 581 | 67 | 1,400 | 161 | 1,850 | 213 |
| Low Cost - Revised Standards |  |  |  |  |  |  |  |  |  |
| Pulp Hair - Chrome tan | X-Small | 100 | .02 | 242 | 28 | 360 | 42 | 835 | 96 |
|  | Small | 300 | .06 | 291 | 33 | 570 | 66 | 1,250 | 144 |
|  | Medium | 700 | .14 | 377 | 43 | 705 | 81 | 1,580 | 182 |

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[1] Estimates based upon data provided by EPA and Stanley Consultants, Inc. Cost functions constructed by DPRA were used to generate estimates for alternative sized plants.

[2] MGD based upon the following averages for processes involved: Pulp-hair - Chrome, 4.0 gal/lb. of hide; Save hair - Chrome, 6.0 gal/lb.; and Save hair - Vegetable, 5.0 gal/lb. The estimated average hide weight was 50 lbs. for purposes of calculating wasteflows.

[3] Capital costs are the sum of individual component costs from EPA and Stanley Consultants, Inc. for the various sizes based on DPRA cost functions. The costs as given were for 1971. A factor of 1.076 was used to estimate 1972 costs. The costs include 14% for yardwork, 10% for engineering, and 5% for continencies.

[4] Operating and maintenance costs are determined as 10% of capital costs for direct O&M, and 1.5% of capital costs for taxes and insurance.

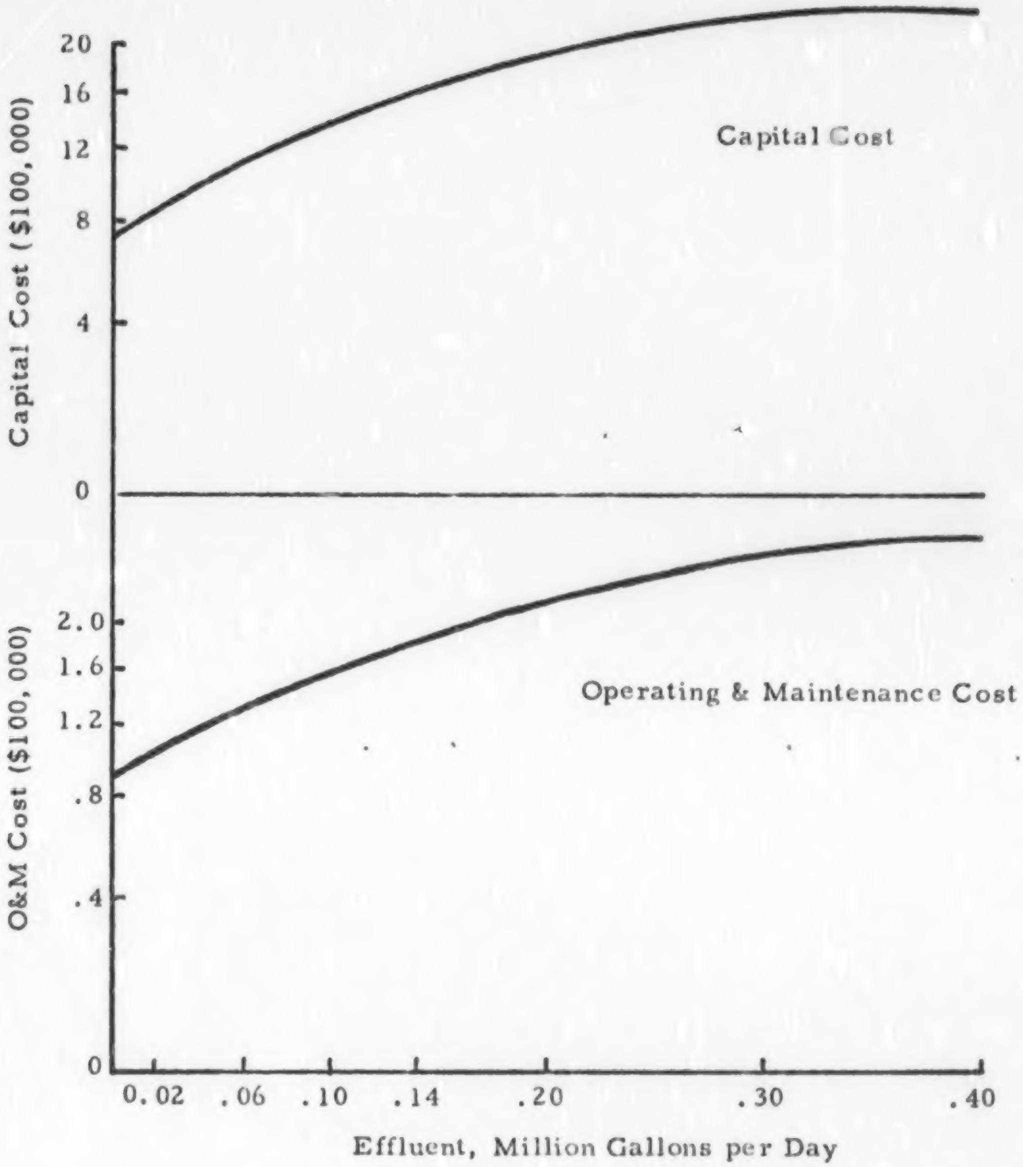

Figure VI-1. Estimated capital and operating and maintenance costs for BAT wastewater treatment. Pulp hair, chrome tan, finish leather tanning industry plants.

Based upon a partial survey (140 plants) of the industry, it is estimated that approximately 60 percent of the tanneries discharge into municipal systems. Further information from EPA indicates that approximately 70 percent of the X-small and small plants are on municipal systems. This portion of the industry is also reported to represent about 60 percent of the productive capacity of the industry. Of those plants discharging to municipal sewers, both no treatment and pretreatment practices exist. There is a trend, however, toward at least some pretreatment by all tanneries following increased effluent restrictions imposed by municipal systems.

It is reported that only a few (21 in the sample of 140 as indicated in the Development Document) of the tanners and finishers have viable secondary waste treatment facilities at the plant site. Three have activated sludge plants; 15 have either aerobic or aerobic-anaerobic lagoons; and 3 have treatment systems with trickling filters. More advanced treatment facilities do not yet exist, although pilot studies have been made of reverse osmosis and activated carbon techniques.

Based on the total number of plants surveyed (140), the 21 plants with secondary treatment systems would represent about 15 percent of the plants in the industry. Presumably, most of the plants with secondary treatment facilities are presently discharging directly into rivers and streams. Hence, a higher percentage of those plants which discharge directly would have some secondary treatment facilities; e.g. the ratio of 15 percent with treatment to 40 percent directly discharging would represent over one-third (about 37 percent) of those which discharge directly.

In order to meet the proposed guidelines, most tanners will be required to provide additional treatment facilities, including pretreatment for those discharging into municipal systems. The following factors contributed to this conclusion:[1/]

1. The strength of treated tannery waste with respect to most parameters is higher than that for most municipalities and other industries.

2. Consistent removal of waste constitutents by treatment facilities expressed as a percent of influent quantities is less than that of most municipalities and industries.

3. Tanneries now having treatment facilities which produce an effluent approaching the quality desired could make necessary modifications to meet quality standards at a reasonable capital investment.

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[1/] Development Document, p. 87.

# VII. IMPACT ANALYSIS

The impacts of direct discharge effluent guidelines on the leather tanning and finishing industry are expected to be generally severe--especially for the X-small and small sized plants. Approximately 40 percent of the tanneries currently discharge directly into surface waters and only about one-third of these are estimated to have some secondary waste treatment facilities. Even these facilities must be upgraded to meet the proposed BPT and BAT guidelines. The balance of the plants discharging directly will need extensive waste treatment improvements.

The guidelines will allow for plants with a capacity of 800 hides per day or less to achieve a lower standard to meet the BPT requirements, however, these plants will have to meet the BAT standards as established for all plants.

For the 60 percent which discharge into municipal systems, more stringent pretreatment practices are generally expected to become necessary. This is expected due to the difficult treatability of particular waste constituents such as chromium and sulfides. Estimated pretreatment costs are typically high for various types of plants, e.g., approximately 60 percent of the estimated BPT costs. Thus, if most plants discharging into municipal systems must provide pretreatment, then pollution control impacts will affect all segments of the leather tanning (wet process) industry.

In this section, the estimated impacts of pretreatment, BPT, BAT and NSPS standards, as proposed, are discussed. The NSPS standards are equal to the BPT and BAT standards beginning in 1977 and 1983, respectively. Estimated impacts are based primarily on expected financial effects of the pollution control costs on representive model plants in the industry. The model plants used are as described in detail in Chapter III and consist of four sizes of pulp hair chrome tan plants. The sizes include: X-small, equivalent to 100 hides per day; small, 300 hides per day; medium, 700 and large, 2,000 hides per day.

The impacts considered in this analysis include the following:

- Price effects
- Financial effects
- Production effects
- Employment effects
- Community effects
- Other effects, e.g., balance of payments

## A. Price Effects

### 1. Required Price Increases

The estimated price increases required to allow the Net Present Value of the firm to a constant level after the imposition of effluent control standards for the various treatment levels is summarized as follows with the results of a more detailed analysis including ± 30 percent for the various costs to achieve the standards contained in Table VII-1:

| | Percent Change in Price Needed[1] | | | |
|---|---|---|---|---|
| Plant Size | Pretreatment | BPT | BAT | BAT over BPT |
| X-small | 7.6 | 18.8 | 23.2 | 4.5 |
| Small | 2.5 | 7.8 | 9.6 | 1.8 |
| Medium | 1.8 | 5.5 | 6.6 | 1.1 |
| Large | 1.0 | 2.3 | 2.8 | .5 |
| | | Reduced Standards | | |
| X-small | NA | 11.3 | 20.3 | 9.0 |
| Small | NA | 4.1 | 8.1 | 4.0 |
| Medium | NA | 3.4 | 5.8 | 2.4 |

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[1] Such that the net income of the firm remains constant.

### Expected Price Increases

The above projected price increases would be applicable at the indicated plant level assuming each plant could pass through cost increases due to the installation of pollution control facilities. An analysis of industry structure and pricing mechanisms suggests that in an extremely price competitive industry such as leather tanning and finishing, only the large firms may be expected to pass through the resulting cost increase. This argument is strengthened by the fact that the large firms produce approximately 65-75 percent of the total volume.

The target BPT projected increase in price is approximately 2.3 percent with a range of 1.6 - 3.0 representing a range of ± 30 percent in control costs to meet the BPT standards. This approximates the required price increase by large plants to maintain the same level of profit as before treatment. An additional incremental price increase of .5 percent is required to cover the BAT guidelines.

Another factor affecting expected price changes is that approximately 60 percent of the tanneries are linked to municipal treatment systems. In these cases, only pretreatment costs are expected to be incurred. In summary, the projected "actual" industry-wide price increases (based on the factors described) amount to 1.5 percent for BPT and an additional 0.2 percent (total of 1.7 percent) for BAT. These increases are summarized as follows:

Projected Price Increase

| Period Beginning | Type of Treatment | Percent Plants Requiring | Percent Price Increase[1] | Weighted Average Increase |
|---|---|---|---|---|
| 1977 | Pretreatment | 60% | 1.0) | 1.5 |
|  | BPT | 40% | 2.3) |  |
| 1983 | Pretreatment | 60% | 0) | .2 |
|  | BAT | 40% | 0.5) |  |

[1] Incremental price increase

It is understood that the tanning margin remains nearly constant despite rather marked changes in raw product prices. This suggests that price increases (due to cost changes) which affect the entire industry would be possible. However, this assumption does not address the aspect of foreign competition. Most likely, competitive tanneries in other countries will not be faced with increased cost due to pollution controls in the foreseeable future. Since tanneries obviously have been losing volume to international competition on the basis of higher labor costs, any increase in the industry processing costs will only tend to aggravate an already serious problem. International competition might therefore result in lower price increases than would otherwise be expected. Further data is needed to make a more definitive assessment of this factor.

## B. Financial Effects

Net Profits after tax in absolute amounts as well as a percent of sales and/or a percent of invested capital are given in Table VII-2 for the baseline position as well as after the imposition of various control levels. Under baseline conditions, net profits range from a negative $5,200 for the

Table VII-1. Percent increase in prices to keep net income constant

| Plant Size | Pretreatment |  |  | BPT |  |  | BAT |  |  | BAT over BPT |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | -30 | -- | +30 | -30 | -- | +30 | -30 | -- | +30 | -30 | -- | +30 |
| 100 hides/day | 5.3 | 7.6 | 9.9 | 13.2 | 18.8 | 24.5 | 16.3 | 23.2 | 30.3 | 3.1 | 4.4 | 5.8 |
| 300 hides/day | 1.9 | 2.5 | 3.1 | 5.0 | 7.8 | 10.6 | 6.3 | 9.6 | 12.9 | 1.2 | 1.8 | 2.3 |
| 700 hides/day | 1.3 | 1.8 | 2.4 | 3.9 | 5.5 | 6.8 | 4.8 | 6.6 | 8.0 | .8 | 1.1 | 1.2 |
| 2,000 hides/day | .7 | 1.0 | 1.2 | 1.6 | 2.3 | 3.0 | 1.9 | 2.8 | 3.6 | .3 | .5 | .6 |
| Reduced Standards |  |  |  |  |  |  |  |  |  |  |  |  |
| 100 hides/day | NA | NA | NA | 7.9 | 11.3 | 14.7 | 14.2 | 20.3 | 26.4 | 6.3 | 9.0 | 11.7 |
| 300 hides/day | NA | NA | NA | 3.3 | 4.1 | 5.8 | 6.0 | 8.1 | 11.0 | 2.7 | 4.0 | 5.2 |
| 700 hides/day | NA | NA | NA | 2.4 | 3.4 | 4.3 | 4.2 | 5.8 | 6.8 | 1.8 | 2.4 | 2.5 |

X-small plant to a high of $587,200 for the large, 2,000 hide per day plant. As a percent of sales, this ranges from less than 0 to a high of 3.9 percent. As a percent of invested capital, net profits for the X-small and small plant are very low, however, for the medium and large plants they range from 11.1 percent to 12.8 percent respectively.

The imposition of pollution controls substantially reduces net income for all firms. Net income is reduced for X-small firms from a negative $5,200 to a negative $55,000 for pretreatment and negative $79,000 for BPT even considering the lower standards for small plants.

Small firms with a baseline income of $40,500 are projected to experience an income reduction to $4,600 for those plants that require pretreatment only. For those plants that must install BPT and BAT controls income is reduced to negative numbers. Net income for the medium 700 hides per day plant is reduced from $177,000 to $137,200 for pretreatment costs and to $3,600 or 0.1 percent of sales with the imposition of the full BAT standards.

The impact on large firms is not as severe as for smaller plants with baseline net income being reduced from $587 thousand to $525 thousand for plants on municipal systems and requiring only pretreatment facilities to $438 thousand and $390 thousand for BPT and BAT respectively. This represents a reduction in after tax returns on investment from 12.8 percent to 8.5 percent for BAT.

After tax return on investment is also shown in Table VII-2. A pattern similar to the net profit picture emerges from the imposition of controls. Profit potential on investment for small plants is generally eliminated. For medium sized plants, the baseline estimate of 11 percent after tax ROI is reduced to 8.6 with pretreatment facilities and to 0.2 percent following the imposition of BAT standards without the price increase. The ROI for medium plants is reduced from 11.1 percent to 3.3 and 0.2 percent following the imposition of BPT and BAT controls. For large plants the return on invested capital is reduced from 12.8 percent under baseline conditions to 9.6 and 8.5 with the imposition of BPT and BAT standards assuming no price increase.

With the projected increases in price of 1.5 percent for BPT and an additional .2 percent for BAT, some recovery of profits can be achieved by the small and medium sized plants. By design, profits for large plants connected to municipal systems and requiring only pretreatment will be slightly higher after the imposition of controls than before assuming they take full advantage of the expected price increase.

Table VII-2. Net profits and return on investment for pulp hair-chrome tan with finishing plants before and after controls

| | Plant Size | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | X Small 100 hides/day | | | Small 300 hides/day | | | Medium 700 hides/day | | | Large 2,000 hides/day | | |
| | Net income ($000) | Net income as % of sales (%) | After tax ROI (%) | Net income ($000) | Net income as % of sales (%) | After tax ROI (%) | Net income ($000) | Net income as % of sales (%) | After tax ROI (%) | Net income ($000) | Net income as % of sales (%) | After tax ROI (%) |
| **Before Price Increase** | | | | | | | | | | | | |
| **Base Line** | - 5.2 | <0 | <0 | 40.5 | 1.9 | 5.4 | 177.7 | 3.6 | 11.1 | 587.2 | 3.9 | 12.8 |
| **Pretreatment** | | | | | | | | | | | | |
| **(1 to 5 years)** | - 54.8 | <0 | <0 | 4.6 | .2 | .6 | 137.2 | 2.8 | 8.6 | 525.2 | 3.5 | 11.5 |
| **(5 to 20 years)** | - 62.5 | <0 | <0 | - 2.9 | <0 | <0 | 131.4 | 2.6 | 8.2 | 517.9 | 3.4 | 11.3 |
| **BPT Control** | -128.2 | <0 | <0 | -129.2 | <0 | <0 | 52.1 | 1.0 | 3.3 | 437.9 | 2.9 | 9.6 |
| **BPT Reduced** | - 79.0 | <0 | <0 | - 51.3 | <0 | | 102.2 | | | | | |
| **BAT Control** | -176.4 | <0 | <0 | -190.7 | <0 | <0 | 3.6 | 0.1 | 0.2 | 389.9 | 2.6 | 8.5 |
| **After Price Increase 1/** | | | | | | | | | | | | |
| **Pretreatment** | | | | | | | | | | | | |
| **(1 to 5 yrs)** | - 44.8 | <0 | <0 | 26.1 | 1.2 | 3.5 | 165.5 | 3.3 | 10.3 | 643.1 | 4.3 | 14.0 |
| **(5 to 20 yrs)** | - 52.5 | <0 | <0 | 23.6 | 1.3 | 3.8 | 170.5 | 3.4 | 10.7 | 659.0 | 4.4 | 14.4 |
| **BPT Control** | -118.2 | <0 | <0 | - 97.2 | <0 | <0 | 104.9 | 2.1 | 6.6 | 555.8 | 3.7 | 12.1 |
| **BPT Reduced** | - 69.0 | <0 | <0 | -19.3 | | | 155.0 | 3.1 | 9.7 | | | |
| **BAT Control** | -165.1 | <0 | <0 | -154.4 | <0 | <0 | 69.0 | 1.4 | 4.3 | 523.5 | 3.5 | 11.4 |

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1/ **For years 1 to 5, 1.5% increase over baseline; and for years 5 to 20, 1.7% over baseline.**

X-small and small plants are severely impacted and cannot achieve a positive return even after the expected price increase is taken into consideration. Small plants that are on municipal systems can return their profits to slightly over one-half their original levels or achieve a 3.8 percent return on invested capital following the BAT 0.2 percent price increase.

Medium size plants with less than 800 hides per day will have profit levels returned to near normal conditions following expected price increase for BPT or at an estimated $155 thousand compared with $178 thousand estimated under baseline conditions. Following the imposition of BAT profits will be reduced to $69 thousand or 4.3 percent ROI. This leaves medium size plants in a marginal situation after BAT.

Profits for large plants are returned to a near normal situation assuming the industry is successful in achieving the expected price increase.

Net Present Value (NPV) - Another measure of the financial capacity of a plant is the Net Present Value (NPV) of its future streams of costs and revenues. By discounting at the cost of capital rate, positive NPV's would indicate the likelihood of continued plant operation versus closure. To complete this analysis, the following assumptions were made:

1. The existing plants have sunk investments but they could be disposed of today for a salvage value and reinvested elsewhere if the tanning and finishing operations were discontinued. However, only 10 percent of the estimated replacement cost is assumed to be recoverable for this industry. This relatively low value represents the fact that manufacturing equipment has little value outside the leather industry and is seldom used for replacement within the industry. Buildings are often very old and would have little or no alternative uses.

2. Revenues and expenses are assumed to remain constant over time, i.e., 20 years of operation.

3. The estimated cost of capital for the industry is 7.0 percent after tax (V-8).

The net present values for all sizes of plants were calculated before and after pollution controls and after the expected price increase. Also a sensitivity analysis was performed with a change of ± percent in the proposed control cost. The results are shown in Table VII-3.

The X-small plant is shown in a marginal position even before the imposition of pollution controls. If they are required to add control facilities, even pretreatment, the NPV is reduced to very low negative numbers. Clearly, they will be forced to shutdown operations.

The small plant is not in a strong financial situation. For those plants that are direct dischargers, the NPV's are reduced to a negative $636 thousand for BPT assuming reduced standards and further reduced to -$1,546 thousand following the imposition of BAT standards. Even with a price rise, these plants will not survive. The small plants linked to a municipal system are in a very marginal position. Considering the projected price increase, the NPV of the plants is estimated at $71,000. With a ± 30 percent charge in the cost of controls, the NPV ranges from -$20,000 to $191,000.

The medium sized firms able to dump into municipal facilities will continue to be in a strong financial position after the imposition of controls. With the reduced standards and expected price rise, the NPV of medium sized plants is estimated at $832 thousand; however, this is reduced to $122 thousand after the imposition of BAT standards. Thus, the medium sized plant will be placed in a very marginal position following the imposition of BAT standards. An indication of the sensitivity of this position can be demonstrated when the BAT control costs are increased/decreased by 30 percent. With an increase of 30 percent in control costs, the NPV decreases to $399 thousand which clearly indicates a shutdown situation. If pollution control costs are decreased by 30 percent, the NPV of the plant increases to $649 thousand after the expected price increase.

Large plants have a positive NPV for all levels of treatment but profit levels are reduced.

Table VII-3. Net present value of model plant cash flows ($000) before and after projected price increase[1/]

| | X-Small | | Small | | Medium | | Large | |
|---|---|---|---|---|---|---|---|---|
| | Before | With Price Increase | Before | With Price Increase | Before | With Price Increase | Before | With Price Increase |
| Baseline | - 65 | | 296 | | 1,413 | | 5,056 | |
| Pretreatment | | | | | | | | |
| +30% Target cost | -762 | -674 | -243 | -20 | 737 | 1,139 | 4,015 | 5,264 |
| Target cost | -601 | -532 | -104 | 71 | 893 | 1,295 | 4,255 | 5,504 |
| -30% Target cost | -441 | -372 | 15 | 191 | 1,048 | 1,450 | 4,495 | 5,744 |
| BPT Control | | | | | | | | |
| +30% Target Cost | -1,795 | -1,726 | -2,102 | -1,763 | -693 | -499 | 2,546 | 3,795 |
| Target cost | -1,396 | -1,327 | -1,471 | -1,132 | -207 | 194 | 3,125 | 4,374 |
| -30% Target cost | -997 | -927 | -838 | -506 | 279 | 681 | 3,705 | 4,953 |
| BPT Reduced Standards | | | | | | | | |
| +30% Target cost | -1,106 | -1,000 | -676 | -676 | 130 | 676 | | |
| Target cost | -867 | -760 | -340 | -340 | 422 | 832 | | |
| -30% Target cost | -627 | -521 | -87 | -87 | 714 | 1,124 | | |
| BAT Control | | | | | | | | |
| +30% Target cost | -1,931 | -1,811 | -2,198 | -1,813 | -895 | -399 | 2,034 | 3,198 |
| Target cost | -1,501 | -1,382 | -1,546 | -1,186 | -343 | -122 | 2,731 | 3,895 |
| -30% Target cost | -1,071 | -952 | -908 | -595 | 178 | 644 | 3,429 | 4,594 |

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[1/] Price increases include 1.5% for years 1 to 5 and 1.7% for 5 to 20.

## C. Production Effects

The leather tanning and processing industry can be accurately described as a declining industry. After reaching a peak physical volume in 1967 of 32.4 million cattle hide equivalents, volume has dropped sharply each year. In 1972 volume had declined to 24.0 million cattle hide equivalents or a decrease of 25 percent from the peak year.

Two major factors have contributed to the decline in the industry:

1. Increased international competition.
2. Increased competition from synthetic leathers both in terms of physical product and price.

In addition, certain segments of the industry have declined because of decreasing supply of skins. This is true for certain species such as reptile, kid, sheep and calf. Cattlehides, however, which accounted for 81 percent of total volume in 1972, have been increasing in total domestic supply, but exports of raw hides expanded from 5.4 million in 1965 to 12.5 million in 1972.

There are presently 176 wet processing plants in the industry today. Thirty-three percent of the plants are categorized as large (or extra large) and handle approximately 73 percent of the total volume. Twenty-seven percent of the plants are categorized as medium and process an estimated 17 percent of the volume. The remainder or 70 plants are small or X-small and produce only 10 percent of the total volume.

### 1. Baseline Closures [1/]

According to the records of the Tanners' Council of America, 33 plants have shutdown or ceased operation between 1968 and June of this year. A distribution of these shutdowns was obtained for 31 of the 33 plants and is contained in Table VII-4. When converted to cattlehide capacity basis this represents capacity to tan approximately 5.3 million hides

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[1/] Baseline closures refer to plant shutdowns related to reasons other than pollution control expenditures. In estimating closures resulting from pollution control we are interested in the incremental effect of the proposed Standards--those over and above the baseline closures.

Of the 31 plants for which descriptive data are available, 9 plants processed special types of hides such as reptile, kid, sheep and calf for which the basic raw material has declined sharply. Seven of the plants processed sole leather for which substitutes have made major inroads. For example, 20 years ago 76 percent of the shoe soles were leather, in 1972 this had declined to 18 percent with no reversal of the trend foreseen. Fifteen of the plants processed cattle side leathers primarily for shoe uppers. Although there has been an abundance of domestically-produced cattle hides, this group has been subjected to severe pressure from international competition and the increasing trend for the domestic shoe industry to use leather substitutes. It is significant to note that slightly over half of the closures in this category were large plants.

Although it is normally a series of factors that finally force a plant to close its doors, the general trends of the industry as noted above appear to have been primary causes. In addition, two of the 31 firms indicated they were unable to meet the financial requirements resulting from strict local pollution control regulations.

Because of the problems that beset the industry today, it is clear that plants will continue to shut down for the following reasons:

- increased international competition
- increased strides in the production of synthetic leather
- higher per unit cost of production in some plants--especially the smaller size
- lower per unit profit
- difficulty in meeting (physically and financially) occupational safety requirements
- plants becoming physically worn out
- inadequate owner income
- present owner reaching retirement age

We are estimating baseline closures to continue at the same rate as over the past five years and will amount to approximately 28 plants through 1977. By size category this amounts to:

| | |
|---|---|
| Small | 9 plants |
| Medium | 9 plants |
| Large | 10 plants |

Table VII-4. Distribution of historical tanning plant closures by size and type, 1968-1973

| Size | Special [1] | Sole Leather | Cattle side | Total |
|---|---|---|---|---|
| Small | 4 | 1 | 5 | 10 |
| Medium | 4 | 4 | 2 | 10 |
| Large | 1 | 2 | 8 | 11 |
| Total | 9 | 7 | 15 | 31 |

[1] Includes reptile, kid, sheep and calf.

Notes: 1. Five of the above have been reopened with a modified product line.
2. A total of 33 plants closed, two of which are unidentified.

Source: Tanners' Council of America.

## 2. Capital Availability

The ability of a firm to finance new investment for pollution abatement is a function of several critical financial and economic factors. In general terms, new capital must come from one or more of the following sources, (1) funds borrowed from outside sources, (2) equity capital through the sale of common or preferred stock, (3) internally generated funds -- retained earnings and the stream of funds attributed to depreciation of fixed assets.

It appears that capital availability will be a severe problem the industry will encounter when investing in pollution control facilities. To place this problem in its proper setting, some of the relevant conclusions as discussed in Chapter II-C are summarized below:

1. The industry has a large number of family-owned and operated plants especially among the small and medium sized categories.

2. The family owned plants are largely financed with internal capital and maintain a low level of long-term debt. The large firms are likely to possess capital structures substantially different from those exhibited by the small companies.

3. New expenditures have been modest and have averaged about 17 million per year--mainly for equipment.

4. Over 70 percent of the physical plants are over 50 years old.

5. The industry has had difficulty obtaining capital to cover their operating requirements because of raw material price increases since August, 1971.

6. Leather tanning and finishing is a declining industry and subject to severe international pressure.

7. There has been an apparent reluctance of outside capital sources to invest in or lend money to the industry.

According to the Development Document the BPT total investment required in pollution control equipment to meet the BPT guidelines amounts to $45.5 million and an additional investment of $15.2 million to meet BAT guidelines.

Total fixed investment in the industry is estimated at roughly $130 to $140 million. Therefore the estimated investment cost required to meet BPT and BAT Standards amounts to nearly one-half of the present total fixed investment in the industry.

A further indication of the financing problems the industry will face can be obtained by comparing the estimated capital investment for control facilities to meet the BPT and BAT guidelines with the estimated replacement value for the respective plants. These data are for Category 1 -- pulp hair with chrome tanning -- with finishing.

| | BPT Level $ Thousand | BAT Level $ Thousand | Plant Replacement Value $ Thousand |
|---|---|---|---|
| X-small | 360[1] | 835 | 245 |
| Small | 570[1] | 1,250 | 635 |
| Medium | 705[1] | 1,580 | 1,200 |
| Large | 1,400 | 1,850 | 3,115 |

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[1] To meet reduced standards.

It is clear from these illustrations and the general condition of the industry that the leather tanning and finishing industry will have difficulty obtaining capital to finance the facilities to meet the proposed guidelines.

### 3. Plant Shutdowns Resulting From Pollution Control Guidelines

The plants' ability to finance and install new pollution control equipment was viewed primarily from two analyses. Net profit as a percent of sales and as a percent of investment with and without pollution control equipment was viewed as a firm's ability to recover capital expenditure in pollution control equipment and operation. The NPV analysis was used to view the future earnings of the company with the imposition of controls compared to the salvage value of the firm. If the present salvage value of the firm is greater than the present value of future earnings with the imposition of controls, a shutdown situation is suggested. By using both the conventional analysis and the NPV analysis it is believed a clearer picture of the firm's financial picture can be obtained.

According to information received from EPA, any plant with less than 50,000 gallons of water flow per day that does not constitute more than 5 percent of total effluent going into the municipal system, provides no toxic materials and/or the aggregate of all small plants in a system is not significant, is exempt from the pretreatment requirements.

At the present time chromium is not classified as a toxic material. Thus, under present regulations certain leather tanning plants would be exempted from pretreatment requirements. Only the X-small plants fall in this category. As a result, the impact on the leather tanning industry was assessed under the following conditions:

With Municipal Exemption
Without Municipal Exemption

It is well to note that under present regulations the X-small plants would be exempted from the requirement to install pretreatment facilities; however, chromium may be added to the list of toxic materials which would require the X-small plants to pretreat. The results of these analyses are shown in Table VII-5.

## With Municipal Exemptions

The imposition of effluent controls will severely impact X-small, small and medium sized plants--many to the point where a shutdown situation is imminent.

X-small plants: If the municipal exemption continues to be applicable, the only X-small plant that will be forced to close will be the one plant that is a direct discharger.

Small plants: EPA estimates that plants in the small category probably will not meet the criteria for municipal exemptions. Although the 40 small plants disposing into municipal systems will be impacted, they should be in a position to recover enough of their control costs through expected price increases to remain in business. The remaining 17 plants will not be able to meet the BPT standards and will be forced to close even with the reduced standards (for plants of less than 800 hides per day) set by EPA for the 1977 Guidelines.

Medium plants: There are 48 medium sized plants of which 9 are expected to close for baseline reasons. Of the remaining group, 20 are assumed to be on municipal treatment systems. No problem is foreseen with this group. With the reduced standards for plants with less than 800 hides per day, all medium size direct dischargers should continue to operate until 1983. There may be marginal plants within this category that may choose not to invest in facilities to meet the BPT standards and shutdown operations

Table VII-5. Estimated plant closures in the wet process leather tanning industry resulting from pollution control guideline

| Size | Current plant no. | Baseline closures | Plants remaining before controls | Plants disposing by | | With municipal exemption | | | | Without municipal exemption | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Municipal system | Direct discharge | Closures | | Remaining | | Closures | | Remaining | |
| | | | | | | BPT | BAT | BPT | BAT | BPT | BAT | BPT | BAT |
| X-small | 6 | 2 | 4 | 3 | 1 | 1 | 0 | 3 | 3 | 4 | 0 | 0 | 0 |
| Small | 64 | 7 | 57 | 40 | 17 | 17 | 0 | 40 | 40 | 17 | 0 | 40 | 40 |
| Medium | 48 | 9 | 39 | 23 | 16 | 0 | 8 | 39 | 31 | 0 | 8 | 39 | 31 |
| Large | 43 | 8 | 35 | 21 | 14 | 0 | 0 | 35 | 35 | 0 | 0 | 35 | 35 |
| X-large | 15 | 2 | 13 | 8 | 5 | 0 | 0 | 13 | 13 | 0 | 0 | 13 | 13 |
| | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 176 | 28 | 148 | 95 | 53 | 18 | 8 | 130 | 122 | 21 | 8 | 127 | 119 |

in 1977; however, we are not projecting any shutdowns on this basis. To meet the 1983 standards, considerable investment will have to be made by the medium sized plants, especially those with less than 800 hides per day. On this basis, one-half of the 16 medium sized plants are projected to shutdown. This will most likely consist of smaller plants in the medium sized category.

Large plants: None of the large or extra large plants are projected to close; however, there may be some of these plants that are unable to develop the capital necessary to install pollution control facilities.

In summary, we are projecting the following closures to occur if the present municipal exemption remains in effect:

| | Plant closures | |
|---|---|---|
| | BPT | BAT |
| X-small | 1 | 0 |
| Small | 17 | 0 |
| Medium | 0 | 8 |
| Large | 0 | 0 |
| X-large | 0 | 0 |
| | 18 | 8 |

Without Municipal Exemption

If the municipal exemption is eliminated, the three X-small plants disposing of water into municipal systems will be forced to close. As a result, plant closures will be as follows:

| | Plant closures | |
|---|---|---|
| | BPT | BAT |
| X-small | 4 | 0 |
| Small | 17 | 0 |
| Medium | 0 | 8 |
| Large | 0 | 0 |
| X-large | 0 | 0 |
| | 21 | 8 |

### 4. Total Production Lost Due to Guidelines

The estimated production lost from the 18 plant shutdowns projected for BPT assuming the municipal exemption remains in effect in 2.8 percent

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1/ The "eased" Standards for plants less than 800 hides per day is applicable only for the 1977 Guidelines. By 1983, however, these plants must meet full BAT Standards.

of the present physical volume of the industry or 3.4 percent of the projected volume of 1976. (Based on recent trends, the projected volume of the industry can be expected to decline by 16 percent by 1976 resulting from baseline closures.) In addition, the closing of 8 medium sized plants resulting from the BAT standards will further reduce the capacity of the industry by 2.7 percent of the present volume or 3.3 percent of the projected volume in 1977. This amounts to a total loss of production of 6.7 percent based on the projected volume of 1977. Total capacity lost from pollution control closures is relatively low compared with number of plants closing (18 percent) because of the size structure of the plants involved.

If the municipal exemption is not continued, the additional production loss will amount to only 0.1 percent of the industry capacity.

In 1972, total leather production in the U. S. amounted to the equivalent of 24.7 million cattle hide units (equivalent). This leather was used in the production of 527 million pair of shoes. However, not all shoes are made of leather. In 1972, 67 percent or 353 million pair of shoes produced domestically were constructed of leather or part leather uppers. On this basis, a loss of 5.5 percent of present production would eliminate the leather required for 19.4 million pair of shoes and commensurate quantities of leather garments, upholstery, small leather goods, etc.

The additional loss resulting from the discontinuance of the municipal exemption would amount to approximately .4 million shoes.

The question then arises regarding what percent of production lost due to pollution related closures would be absorbed by the remaining firms in the industry vs. the percent lost to overseas competitors. Unfortunately, the economic data necessary to accurately assess this question are simply not available. Basically, we are in a demand pull situation for raw hides.

Foreign demand for our raw hides which now take 52 percent of total U.S. produced cattlehides will continue. In fact, it most likely will increase as the two leading nations (second and third to the U.S.) in the export of raw hides, Argentina and Brazil, are in the process or have prohibited the exporting of raw hides as rapidly as their industries can be developed to process them. Brazil has now already switched from a major exporter to an importer and have imported 200 thousand hides this year. Japan's imports of hides from the U.S. have nearly doubled from 1965 to 1972 increasing from 3.8 million to 7.3 in 1972. Communist Bloc countries such as Poland, Yugoslavia, Rumania and Czechoslovakia have more than doubled their imports of raw hides since 1965. As a result, we see increasing international competition for our raw hides.

On the other hand, the demand for leather is basically a derived demand resulting from the demand for shoes. Thus, historically the domestic demand for shoes has tended to control the number of hides tanned in the U. S. However, because of the increased international competition and expected drop in the production of tanned leather in 1977, we expect to see a reversal of this historical trend. In fact, we are arguing that the closing of tanneries in 1977 will cause a shortfall of tanned leather required by the shoe industry.

The U. S. shoe industry has also been losing out to foreign competition. Shoe imports have increased from 14 percent of total shoes sold in the U. S. in 1965 to 36 percent in 1972. In addition, the shoe industry is utilizing more leather substitutes -- particularly for women and children's shoes.

In summary, we are estimating that approximately 50 percent of the production loss from Guideline closures will be lost to overseas competition and the remaining lost production will be picked up by other U. S. tanneries. A net loss of 2.8 percent of total hide production will result in a loss of raw material for the manufacture of 10.0 million pair of shoes and commensurate quantities of leather garments, upholstery, small leather goods, etc.

## D. Employment Effect

The estimated number of employees in the leather tanning and finishing industry is estimated at 23.7 thousand in 1972 down from 30.7 thousand in 1967. Baseline closures over the next five years are estimated to eliminate jobs directly for 3,700 employees in the industry.

Closures resulting from pollution control guidelines are estimated to eliminate 875 jobs by 1977 and an additional 800 jobs in 1983. If the municipal exemption is eliminated, it will increase the loss by 75 jobs in 1977. This considers only direct employees, many of which are from minority groups whose economic integration is sociologically important in the United States. Because of the declining nature of the industry, it is doubtful if they could obtain employment in other tanneries.

Based on information obtained from the Tanners' Council, minority employees compose approximately 35-40 percent of the 23.7 thousand workers in 1973. This can be broken down by region as follows:

| Region | Approximate Percent Minority Employees |
|---|---|
| New England | 16 |
| Mid Atlantic | 62 |
| Chicago area | 70 |
| Milwaukee area | 60 |
| St. Louis area | 60 |
| West Coast | 30 |
| Other | 30 |

In 1967 there were 328,700 employed in the leather tanning and leather products industry (SIC 31) (rubber footware and miscellaneous plastic products not included). This number declined to 273,800 by 1971 largely reflecting a decline in leather tanning and finishing and footwear. Further examination indicates that for each person employed in tanning and finishing, approximately 10 are employed in the leather consuming end of the industry (Table VII-6).

It is difficult to predict the loss of employment in the leather manufacturing segments, but using the direct ratio of 1:10, a loss of 1,675 jobs in the tanning industry would lead to a loss of 16,750 jobs in the leather consuming industry (manufacturing only). However, not all of the employment in the leather manufacturing industry is dependent upon leather as a basic raw material. For example, in 1972, 67 percent of the shoes manufactured in the U. S. had leather or part leather uppers. Using this percentage as an indication of the dependence of the leather consuming industry on the tanning industry and our earlier estimate that 50 percent of lost production will be absorbed

Table VII-6. Number of employees in leather and leather products industry (SIC 31) 1963-1971

| | | 1963 | 1967 | 1970 | 1971 |
|---|---|---|---|---|---|
| 31 | Leather & Leather Products | 327.3 | 328.7 | 295.8 | 273.8 |
| 3111 | Leather Tanning & Finishing | 31.4 | 30.7 | 24.1 | 24.5 |
| | Wet Process | | | | 22.6 |
| | Dry Process | | | | 1.9 |
| | Industrial Leather Belting | 2.9 | 2.7 | 2.1 | 2.0 |
| | Footwear Cut Stock | 14.3 | 13.7 | 12.6 | 11.0 |
| | Footwear, Except Rubber | 201.7 | 198.5 | 180.5 | 166.5 |
| | House Slippers | 11.0 | 12.5 | 11.3 | 10.9 |
| | Leather Gloves & Mittens | 7.7 | 6.3 | 5.5 | 4.9 |
| | Luggage | 16.4 | 21.4 | 16.6 | 14.8 |
| | Women's Handbags | 24.5 | 24.1 | 21.4 | 19.6 |
| | Personal Leather Goods | 12.4 | 12.7 | 15.0 | 12.8 |
| | Leather Goods n.e.c. | 5.0 | 6.1 | 6.7 | 6.8 |
| | Total | 327.3 | 328.7 | 295.8 | 273.8 |

by the remaining industry, a loss of 1,675 jobs in the tanning industry could lead to an additional loss of 5,611 jobs in the leather consuming industry. If you assumed leather substitutes will increase in usage and be used in 40 percent of the shoes (uppers) rather than the current 33 percent, the loss of employment would amount to 5,025.

## E. Community Effects

The exact location of the tanning plants subject to closure is not known at this time. With the exception of Chicago, Boston, Milwaukee, Newark and San Francisco, leather production is located primarily in small communities. Appendix Table A-12 gives the distribution of wet process plants by size and location. Both Massachusetts and New York have heavy concentrations of small to medium size plants with 34 and 23 respectively. Wisconsin has 12, New Jersey 10 and New Hampshire 7. The remaining small to medium sized plants are scattered over a wide area. In many instances tanning plants are the principal employers or payroll sources. Consequently, the closing of a number of small plants would directly impact a number of small communities.

The multiplier effect resulting from the loss of raw material would impact a number of finishers and manufacturers of shoes, handbags, etc. This impact would be more widespread but fall the heaviest on the same states.

## F. International Trade

The impact of pollution controls will have a direct impact on the balance of payments. As discussed in earlier sections, the tanning industry has been rapidly losing volume to international competition. It can be expected that if production capacity is lost due to pollution control guidelines, an increase in the exports of raw hides will result--at least in the short run. It is doubtful if U.S. shoe manufacturers would import tanned hides, but most likely the present trends will continue in that the U.S. would increase its purchases of foreign manufactured shoes and other leather goods.

In 1972, $1.2 billion worth of shoes (296,000,000 pairs) and leather goods were imported (Table IV-4). A projected loss of 2.8 percent of domestic capacity would amount to 10.0 million pair of shoes and related leather goods or approximately $60 million worth of finished leather products. Raw hides constitute approximately 20 percent of the finished price of shoes. Therefore, we could expect to export an additional $12 million worth of hides for a net balance of payments loss of $48 million.

Using the lower production resulting from the municipal exemptions, a projected loss of 2.7 percent of domestic capacity would amount to 9.6 million pairs of shoes and related leather goods or approximately $57.9 million worth of finished leather products. With an increase in raw hide exports of $11.6 million, the net balance of payments loss would amount to $46.3 million.

# VIII. LIMITS OF THE ANALYSIS

There is little published information regarding the structure, pricing, and economic data regarding the leather tanning and finishing industry. Much of the descriptive data used in this report was compiled by the Tanners' Council and is considered to be the most complete and accurate source available. Nevertheless, much of the information required to develop this report did not exist in quantifiable form but was derived from personal discussion with individuals knowledgeable of the industry. This chapter discusses the general accuracy of the report and some of the key assumptions involved.

## A. Accuracy

The analysis was done under very tight time constraints (two months) and time did not permit the development of all aspects of the project in the detail that would be desirable. As a basis for the model plants, we depended upon brief reports published by the USDA and a number of informal discussions (telephone and personal) with knowledgeable individuals in the industry. Data relating to the industry, particularly to size of plant, were fragmentary and numerous assumptions and extrapolations were required. Financial information on the industry is particularly difficult to obtain for reasons explained in the report. In all cases an attempt was made to evaluate available information with second sources to help insure that data and information used were as reliable and representative as possible.

It is believed that the results as presented earlier are generally correct and indicate the proper order of magnitude for the economic impacts of mandatory pollution abatement standards on the leather tanning and finishing industry. Data limitations prohibit a precise quantitative assessment of the impacts of pollution abatement standards.

## B. Range of Error

Different data series and different sections of the analysis will have different error ranges. Estimated ranges of error are as follows:

| | Error Range |
|---|---|
| Number of facilities | ± 5 |
| Size of operating plants | ±20 |
| Projection number of facilities | ±30 |
| Employment | ±10 |
| Price information for products and raw materials | ±10 |
| Processing cost | ±10 |
| Replacement costs for facilities | ±30 |
| Plant closures due to water pollution control costs | ±30 |

## C. Critical Assumptions

In order to establish model plants representative of the industry, several key assumptions had to be made.

### 1. Profitability

Industry statistics indicate that generally large plants are more profitable than small and this assumption was used. However, specific plants may not follow this generalization. For example, small plants may handle specialty products which would not be in competition with large plants. The resulting effect would be a more profitable operation than if they were competing directly with large tanneries.

### 2. Products

There are many different types of leather products produced through various processes. We constructed the model plants around the production of Tannery Run upper shoe leather which is the most prevalent form.

### 3. Other Types of Leather

Only cattlehides were considered in the model plant data. Because of a lack of information, pigskins, goatskins and sheepshins and others were not considered. Results of the model plant analysis were generalized for the entire industry. Indications are that the other segments of the industry may be less profitable.

### 4. Leather Conversion Rate

Conversion from raw hide to finished leather was based on generally accepted conversion ratios.

### 5. Complex Plants

The assumption was made that the model plants produced only one basic product. This would seldom be true. However, the average operation should not be greatly different than is reflected in the model plants.

### 6. Prices

Published prices for cattlehides were used, but published prices do not exist for finished leather. These had to be estimated.

## D. Remaining Issues

Forecasts of industry performance were based on historical trends and expected occurrences. The decline of the industry as seen most vividly over the past five years is projected to continue. This situation could be greatly altered with changes in our international trading regulations. In turn, this would greatly alter the balance of payments impact that can be expected under present trading regulations.

Very little is known with regard to foreign competition with the exception that they have, obviously, lower labor cost. It is not known if they have or are considering similar pollution control regulations or similar occupational safety requirements. Since they obviously have made great strides in capturing the U. S. market, it is expected they will continue to do so.

There has been some discussion of internal production alterations which would reduce and/or change the composition of the waste flow effluent. This may, in fact, represent a more desirable alternative than investing tremendous capital resources in end-of-pipe facilities which have no productive value to the plant. Since investment in end-of-pipe treatment ranges from one third to over 100 percent of the replacement value of the plants-depending on the specific plant size-this is certainly an alternative which plants must consider. This whole area was not considered within the scope of work for this report.

T-1

Table A-1. General statistics for the leather tanning and finishing industry

| Year | All Employees Number (1,000) | All Employees Payroll (million dollars) | Production Workers Number (1,000) | Production Workers Man-hours (millions) | Production Workers Wages (million dollars) | Value added by Manufacture (million dollars) | Cost of materials (million dollars) | Value of shipments (million dollars) | New Capital Expenditures (million dollars) |
|---|---|---|---|---|---|---|---|---|---|
| 1958 Census | 37.1 | 165.5 | 32.5 | 63.4 | 133.2 | 275.8 | 464.9 | 743.1 | 7.9 |
| 1959 ASM | 37.1 | 173.6 | 32.4 | 62.6 | 137.1 | 337.5 | 558.9 | 886.9 | 7.6 |
| 1960 ASM | 34.5 | 163.9 | 30.0 | 57.6 | 128.9 | 278.5 | 508.5 | 790.7 | 6.1 |
| 1961 ASM | 33.2 | 157.9 | 28.7 | 55.0 | 124.0 | 267.5 | 486.7 | 761.1 | 4.7 |
| 1962 ASM | 31.7 | 157.2 | 27.3 | 53.3 | 123.1 | 263.6 | 491.0 | 765.9 | 7.2 |
| 1963 Census | 31.4 | 163.3 | 27.3 | 54.6 | 129.8 | 273.1 | 480.5 | 758.4 | 6.5 |
| 1964 ASM | 31.2 | 169.0 | 27.1 | 54.6 | 131.5 | 300.2 | 481.3 | 783.6 | 7.8 |
| 1965 ASM | 32.0 | 180.0 | 27.9 | 56.9 | 139.0 | 327.0 | 535.6 | 856.7 | 11.3 |
| 1966 ASM | 32.7 | 189.2 | 28.2 | 57.5 | 144.4 | 326.4 | 614.1 | 940.5 | 17.3 |
| 1967 Census | 30.7 | 186.4 | 26.4 | 52.8 | 142.5 | 319.4 | 547.0 | 870.1 | 16.7 |
| 1968 ASM | 31.1 | 196.0 | 26.7 | 53.0 | 151.2 | 349.5 | 524.5 | 877.9 | 16.6 |
| 1969 ASM | 28.8 | 188.1 | 24.4 | 47.4 | 142.8 | 331.2 | 514.9 | 853.9 | 14.4 |
| 1970 ASM | 23.7 | 169.2 | 20.1 | 39.8 | 128.2 | 318.4 | 466.9 | 793.3 | 12.6 |
| 1971 | | | | | | | | | |
| 1972 | | | | | | | | | |

Source: Census of Manufactures and annual Survey of Manufacture.

Table A-2. Value of shipments by product class 1969-1971

| Item | | 1969 | | 1970 | | 1971 | |
|---|---|---|---|---|---|---|---|
| | | Total | Percent | Total | Percent | Total | Percent |
| 3111- | Tanned and finished leather | 802.6 | 100 | 765.9 | 100 | 830.8 | 100 |
| 31111* | Finished cattle hide and kip side leathers | 524.7 | 65 | 481.0 | 63 | 503.9 | 62 |
| 31112* | Finished calf and whole kip leathers | 34.5 | 4 | 40.3 | 5 | 33.0 | 4 |
| 31113* | Finished sheep and lamb leathers | 57.9 | 7 | 55.1 | 7 | 70.6 | 8 |
| 31114* | Other finished leathers, n.e.c | 48.1 | 6 | 51.2 | 7 | 73.2 | 9 |
| 31115* | Rough, russet, and crust leather (not finished in this establishment) | 29.9 | 4 | 31.6 | 4 | 31.2 | 4 |
| 31110 | Tanned and finished leather, n.s.k. | 29.1 | 4 | (29.8) | 4 | 27.2 | 3 |
| 31119 | Contract and commission receipts for tanning and finishing leather owned by others | 78.4 | 10 | 76.9 | 10 | 91.7 | 10 |

Source: Annual Survey of Manufacturers.

T-2

Table A-3. Shoe prices -- estimated average factory value per pair

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Oct. | Nov. | Dec. | Aver. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1955 | 3.49 | 3.54 | 3.46 | 3.39 | 3.26 | 3.32 | 3.39 | 3.53 | 3.46 | 3.40 | 3.33 | 3.56 | 3.43 |
| 1956 | 3.55 | 3.55 | 3.58 | 3.59 | 3.47 | 3.50 | 3.72 | 3.74 | 3.65 | 3.56 | 3.54 | 3.71 | 3.60 |
| 1957 | 3.67 | 3.57 | 3.57 | 3.55 | 3.37 | 3.45 | 3.69 | 3.69 | 3.57 | 3.51 | 3.52 | 3.70 | 3.57 |
| 1958 | 3.57 | 3.58 | 3.50 | 3.46 | 3.30 | 3.38 | 3.59 | 3.69 | 3.62 | 3.52 | 3.54 | 3.77 | 3.55 |
| 1959 | 3.61 | 3.55 | 3.57 | 3.57 | 3.46 | 3.59 | 3.82 | 3.88 | 3.77 | 3.73 | 3.75 | 3.92 | 3.69 |
| 1960 | 3.74 | 3.82 | 3.73 | 3.70 | 3.58 | 3.59 | 3.81 | 3.89 | 3.80 | 3.67 | 3.65 | 3.88 | 3.74 |
| 1961 | 3.82 | 3.74 | 3.69 | 3.66 | 3.65 | 3.63 | 3.81 | 3.85 | 3.78 | 3.65 | 3.63 | 3.91 | 3.73 |
| 1962 | 3.83 | 3.79 | 3.72 | 3.73 | 3.57 | 3.70 | 3.91 | 3.89 | 3.85 | 3.81 | 3.81 | 4.09 | 3.80 |
| 1963 | 4.00 | 3.85 | 3.83 | 3.84 | 3.80 | 3.82 | 3.90 | 3.88 | 3.84 | 3.79 | 3.79 | 4.01 | 3.86 |
| 1964 | 4.02 | 3.97 | 3.90 | 3.89 | 3.91 | 3.89 | 4.00 | 4.04 | 3.98 | 3.83 | 3.93 | 4.10 | 3.99 |
| 1965 | 4.03 | 3.99 | 3.91 | 3.95 | 3.93 | 3.88 | 3.99 | 4.06 | 4.02 | 3.94 | 3.98 | 4.16 | 3.99 |
| 1966 | 4.37 | 4.35 | 4.26 | 4.23 | 4.30 | 4.22 | 4.28 | 4.41 | 4.40 | 4.31 | 4.36 | 4.65 | 4.34 |
| 1967 | 4.57 | 4.52 | 4.57 | 4.64 | 4.57 | 4.51 | 4.61 | 4.58 | 4.57 | 4.53 | 4.54 | 4.73 | 4.58 |
| 1968 | 4.75 | 4.66 | 4.70 | 4.66 | 4.68 | 4.64 | 4.81 | 4.77 | 4.78 | 4.61 | 4.58 | 4.88 | 4.71 |
| 1969 | 4.80 | 4.86 | 4.89 | 5.04 | 4.84 | 4.91 | 4.90 | 4.99 | 5.06 | 4.94 | 4.93 | 5.22 | 4.94 |
| 1970 | 5.11 | 5.18 | 5.36 | 5.20 | 4.97 | 5.02 | 5.10 | 5.23 | 5.15 | 5.09 | 5.11 | 5.54 | 5.17 |
| 1971 | 5.39 | 5.37 | 5.41 | 5.40 | 5.18 | 5.21 | 5.38 | 5.21 | 5.16 | 5.17 | 5.13 | 5.45 | 5.29 |
| 1972 | 5.45 | 5.48 | 5.54 | 5.67 | 5.48 | 5.52 | 5.75 | 5.59 | 5.55 | 5.41 | 5.39 | 6.00 | 5.56 |

Source: Tanners' Council of America, Inc.

Table A-4. The shoe market*

(1,000 Pairs)

| | U. S. Production | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Men's | Women's & Misses' | Juvenile | Slippers & Misc. | Military# | Total | Total* Imports | % Imports of U. S. Production |
| 1961 | 103,336 | 312,613 | 91,687 | 85,271 | 4,500 | 592,907 | 36,668 | 6.2 |
| 1962 | 112,729 | 325,021 | 95,032 | 100,456 | 5,900 | 633,238 | 55,057 | 8.7 |
| 1963 | 110,703 | 310,725 | 88,294 | 94,606 | 5,200 | 604,328 | 62,820 | 10.4 |
| 1964 | 119,859 | 308,137 | 88,658 | 96,136 | 6,500 | 612,790 | 75,372 | 12.3 |
| 1965 | 118,195 | 316,420 | 91,575 | 100,039 | 7,690 | 626,229 | 87,632 | 14.0 |
| 1966 | 126,903 | 320,082 | 90,696 | 104,015 | 15,784 | 641,696 | 96,135 | 15.0 |
| 1967 | 123,720 | 285,583 | 86,077 | 104,584 | 14,800 | 599,964 | 129,137 | 21.5 |
| 1968 | 126,259 | 316,680 | 83,641 | 115,847 | 9,900 | 642,427 | 175,292 | 27.3 |
| 1969 | 117,563 | 265,525 | 79,143 | 114,731 | 6,851 | 576,961 | 202,040 | 35.0 |
| 1970 | 119,738 | 253,387 | 78,691 | 110,502 | 4,770 | 562,318 | 241,560 | 43.0 |
| 1971 | 117,672 | 232,447 | 75,756 | 109,902 | 4,614 | 535,777 | 268,569 | 50.1 |
| 1972 | 126,562 | 218,391 | 72,651 | 109,051 | 3,800 | 526,655 | 296,665 | 56.3 |

* Non-rubber footwear.

# Included in men's shoe production.

Source: Tanners' Council of American, Inc.

Table A-5. World cattle numbers (1,000 head)

| | 1961-1965 Average | 1969 | 1970 | 1971(1) | 1972(2) |
|---|---|---|---|---|---|
| Canada | 11,332 | 11,475 | 11,828 | 12,217 | 12,633 |
| United States | 103,892 | 109,885 | 112,303 | 114,578 | 117,862 |
| Mexico | 20,210 | 24,876 | 25,123 | 26,081 | 26,830 |
| Total No.America | 151,551 | 165,661 | 169,084 | 173,185 | 178,204 |
| Argentina | 43,341 | 48,298 | 48,440 | 47,786 | n.a. |
| Brazil | 78,718 | 92,845 | 95,268 | 96,576 | n.a. |
| Colombia | 15,780 | 19,576 | 20,359 | 21,173 | 21,798 |
| Total So.America | 168,937 | 193,505 | 197,123 | 200,815 | 202,263 |
| West Europe | 83,538 | 88,895 | 88,443 | 87,122 | 86,911 |
| East Europe | 32,964 | 34,675 | 34,054 | 34,688 | 35,270 |
| U.S.S.R. (Europe & Asia) | 83,493 | 95,735 | 95,162 | 99,225 | 102,500 |
| Africa | 124,453 | 135,296 | 135,801 | 137,618 | 139,057 |
| Asia | 405,650 | 446,235 | 447,507 | 448,632 | 449,404 |
| Oceania | 25,338 | 29,622 | 31,354 | 33,616 | 36,135 |
| TOTAL WORLD | 1,075,924 | 1,189,624 | 1,198,528 | 1,214,901 | 1,229,744 |

Source: Foreign Agricultural Service, U. S. Department of Agriculture.

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Table A-6. Packer hide and skin prices: Average per pound, Chicago, 1959 to date[1]

| Year | Steers |  |  |  | Cows |  |  | Bulls |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Heavy native | Heavy Texas | Butt branded | Colo-rados | Heavy native | Light native | Branded | Native | Branded | Calf-skins | Kip-skins |
|  | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1959 | 19.16 | 16.97 | 17.22 | 16.28 | 21.60 | 25.61 | 20.45 | 15.20 | 14.20 | 64.95 | 52.32 |
| 1960 | 13.72 | 11.36 | 11.77 | 10.62 | 15.13 | 18.81 | 13.58 | 10.88 | 9.93 | 55.64 | 43.92 |
| 1961 | 14.91 | 12.73 | 13.00 | 11.95 | 16.02 | 19.54 | 14.78 | 11.09 | 10.17 | 62.16 | 51.70 |
| 1962 | 15.19 | 13.56 | 13.64 | 12.69 | 15.80 | 18.50 | 14.85 | 11.07 | 10.07 | 61.08 | 44.48 |
| 1963 | 11.23 | 9.76 | 9.74 | 8.86 | 11.80 | 12.83 | 10.54 | 8.00 | 7.00 | 36.61 | 29.99 |
| 1964 | 10.32 | 8.18 | 8.47 | 7.59 | 11.20 | 13.23 | 8.95 | 7.44 | 6.44 | 40.63 | 32.34 |
| 1965 | 13.93 | 12.07 | 12.39 | 11.58 | 14.00 | 15.60 | 12.57 | 9.17 | 8.17 | 53.29 | 34.09 |
| 1966 | 17.42 | 16.17 | 16.33 | 15.64 | 18.12 | 20.21 | 16.65 | 12.28 | 11.28 | 59.09 | 45.67 |
| 1967 | 11.73 | -- | 10.31 | 9.60 | 12.43 | 16.34 | 10.80 | -- | -- | 46.51 | 33.11 |
| 1968 | 11.84 | -- | 9.51 | 8.51 | 11.75 | 15.73 | 9.64 | -- | -- | 54.85 | 32.96 |
| 1969 | 14.38 | -- | 12.48 | 11.59 | 14.85 | 18.35 | 12.95 | -- | -- | 56.33 | 35.10 |
| 1970 | 12.85 | -- | 11.80 | 9.95 | 13.44 | 16.98 | 11.35 | -- | -- | 33.55 | 27.81 |
| 1971 | 14.53 | -- | 11.95 | 10.80 | 14.17 | 17.03 | 11.63 | -- | -- | 30.17 | 22.70 |
| 1972 | 29.70 | -- | 27.20 | -- | -- | 34.40 | -- | -- | -- | 51.77 | -- |
| 1973 | 31.60 | -- | 29.36 | -- | -- | 46.30 | -- | -- | -- | 65.50 |  |
| 1974 |  |  |  |  |  |  |  |  |  |  |  |

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[1] Prices for packer steer, cow and bull hides obtained from Livestock Market News publication beginning in 1967. Data for calfskins and kipskins compiled from National Provisioner weekly publication. Calfskins classified as (North) 10-15 lb., kipskins classified as (North) 15-25 lb.

[2] January, February, March only.

Source: USDA Livestock and Meat Statistics, 1971 and earlier. 1972 Tanners' Council of America.

## Table A-7. Movement into sight of cattlehides
(1, 000 hides)

|  | Estimated Total Slaughter | Exports and Re-exports | Imports | Net Exports | Total Movement To Tanners(1) |
|---|---|---|---|---|---|
|  | ANNUAL TOTALS |  |  |  |  |
| 1955 | 28,257 | 5,863 | 333 | 5,530 | 25,537 |
| 1956 | 29,242 | 4,943 | 340 | 4,603 | 26,441 |
| 1957 | 28,514 | 6,518 | 167 | 6,351 | 24,924 |
| 1958 | 25,880 | 5,434 | 417 | 5,017 | 23,690 |
| 1959 | 25,223 | 4,107 | 1,025 | 3,082 | 22,606 |
| 1960 | 27,590 | 6,899 | 331 | 6,568 | 22,044 |
| 1961 | 28,012 | 7,645 | 294 | 7,351 | 22,271 |
| 1962 | 28,516 | 7,121 | 413 | 6,708 | 22,585 |
| 1963 | 29,800 | 7,972 | 360 | 7,612 | 21,815 |
| 1964 | 33,262 | 11,540 | 314 | 11,226 | 22,799 |
| 1965 | 34,550 | 13,320 | 301 | 13,019 | 23,241 |
| 1966 | 35,260 | 14,205 | 221 | 13,984 | 23,572 |
| 1967 | 35,381 | 11,866 | 232 | 11,634 | 23,607 |
| 1968 | 36,076 | 12,853 | 494 | 12,359 | 23,617 |
| 1969 | 36,118 | 14,790 | 277 | 14,513 | 21,096 |
| 1970 | 35,740 | 15,229 | 385 | 14,844 | 20,199 |
| 1971 | 36,280 | 15,969 | 275 | 15,694 | 20,189 |
| 1972 | 36,480 | 17,595 | 292 | 17,303 | 19,218 |

1/ Includes both domestic and foreign hides and side leather kips.

Source: Tanners' Council of America, Inc.

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Table A-8. . Movement into sight of all calfskins and kips
(1, 000 skins)

| | Federal Inspected Slaughter | Total Commercial Slaughter | Exports & Re-exports | | | Imports | | | Movement Calf and Whole Kip To Tanners(1) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Calf | Kip | Total | Calf | Kip | Total | |
| | | | | ANNUAL TOTALS | | | | | |
| 1955 | 7,499 | 12,377 | 1,815 | 1,765 | 3,580 | 1,189 | 288 | 1,492 | 10,234 |
| 1956 | 7,843 | 12,512 | 1,851 | 1,259 | 3,110 | 924 | 272 | 1,196 | 8,346 |
| 1957 | 7,324 | 11,904 | 2,076 | 1,226 | 3,302 | 1,103 | 269 | 1,372 | 9,074 |
| 1958 | 5,672 | 9,315 | 2,362 | 719 | 3,081 | 555 | 353 | 908 | 7,648 |
| 1959 | 4,875 | 7,683 | 1,422 | 483 | 1,905 | 1,103 | 462 | 1,565 | 6,394 |
| 1960 | 5,260 | 8,225 | 1,648 | 481 | 2,129 | 860 | 503 | 1,363 | 6,407 |
| 1961 | 5,005 | 7,701 | 1,994 | 557 | 2,551 | 763 | 661 | 1,424 | 6,488 |
| 1962 | 4,979 | 7,494 | 1,715 | 345 | 2,060 | 669 | 778 | 1,447 | 5,757 |
| 1963 | 4,535 | 6,833 | 1,611 | 253 | 1,864 | 875 | 1,037 | 1,912 | 5,851 |
| 1964 | 4,820 | 7,254 | 2,118 | 280 | 2,398 | 926 | 1,084 | 2,010 | 6,663 |
| 1965 | 5,077 | 7,419 | 2,010 | 474 | 2,484 | 458 | 607 | 1,065 | 5,745 |
| 1966 | 4,432 | 6,647 | 2,087 | 519 | 2,606 | 242 | 438 | 680 | 4,275 |
| 1967 | 4,001 | 5,919 | 1,973 | 495 | 2,468 | 480 | 357 | 837 | 4,059 |
| 1968 | 3,876 | 5,443 | 1,852 | 382 | 2,234 | 509 | 285 | 794 | 3,854 |
| 1969 | 3,637 | 4,863 | 1,238 | 414 | 1,656 | 356 | 334 | 690 | 3,390 |
| 1970 | 3,025 | 4,072 | 1,076 | 241 | 1,317 | 189 | 353 | 542 | 2,425 |
| 1971 | 2,806 | 3,689 | 1,974 | 254 | 2,228 | 67 | 168 | 235 | 1,120 |
| 1972 | 2,420 | 3,051 | 1,613 | 451 | 2,064 | 87 | 174 | 261 | 1,491 |

1/ Includes both domestic and foreign skins; excludes kips for side leather.

Source: Tanners' Council of America, Inc.

Table A-9. All sheep and lamb leathers, 1955 - 1972
(1,000 skins)

| | Federal Inspected Slaughter | Net Imports | Input | | | Excluding Shearlings | |
|---|---|---|---|---|---|---|---|
| | | | Total | Shear-lings | All Other | Produc-tion | Deliv-eries |
| | | | | ANNUAL TOTALS | | | |
| 1955 | 14,384 | 19,247 | 26,597 | 2,437 | 24,160 | 24,006 | 24,568 |
| 1956 | 14,228 | 25,825 | 27,119 | 2,561 | 24,558 | 24,713 | 24,793 |
| 1957 | 13,234 | 20,487 | 25,517 | 1,987 | 23,530 | 23,527 | 23,350 |
| 1958 | 12,397 | 22,404 | 27,368 | 1,892 | 25,476 | 25,550 | 25,874 |
| 1959 | 13,466 | 29,865 | 32,731 | 2,307 | 30,424 | 29,753 | 29,859 |
| 1960 | 14,036 | 23,475 | 30,905 | 2,179 | 28,726 | 28,321 | 28,060 |
| 1961 | 15,036 | 23,288 | 31,898 | 2,200 | 29,698 | 29,627 | 29,959 |
| 1962 | 14,692 | 23,461 | n.a. | n.a. | 27,622 | 27,697 | 27,814 |
| 1963 | 13,955 | 21,555 | n.a. | n.a. | 30,980 | 21,292 | 31,485 |
| 1964 | 12,947 | 25,952 | n.a. | n.a. | 28,753 | 28,908 | 28,981 |
| 1965 | 11,710 | 25,167 | n.a. | n.a. | 27,578 | 27,786 | 27,896 |
| 1966 | 11,553 | 23,464 | n.a. | n.a. | 27,176 | 26,897 | 26,702 |
| 1967 | 11,516 | 15,005 | n.a. | n.a. | 25,669 | 26,180 | 26,461 |
| 1968 | 10.888 | 25,580 | n.a. | n.a. | 29,679 | 29,328 | 29,241 |
| 1969 | 10,070 | 15,513 | n.a. | n.a. | 23,444 | 23,297 | 23,106 |
| 1970 | 10,010 | 13,507 | n.a. | n.a. | 21,310 | 21,868 | 22,177 |
| 1971 | 10,256 | 12,073 | n.a. | n.a. | 20,008 | 19,895 | 19,870 |
| 1972 | 9,903 | 10,470 | n.a. | n.a. | 18,641 | 18,781 | 18,731 |

Source: Tanners' Council of America, Inc.

Table A-10. All goat and kid skins and leather, 1955 - 1972
(1, 000 skins)

|  | Net Imports Raw Skins | Wettings | Your % | Production | Deliveries | Leather Exports (1,000 Sq. Ft.) | Leather Imports (1,000 Sq. Ft.) |
|---|---|---|---|---|---|---|---|
| ANNUAL TOTALS |  |  |  |  |  |  |  |
| 1955 | 28,504 | 26,879 |  | 26,109 | 27,005 | 4,348 | 7,133 |
| 1956 | 27,004 | 24,498 |  | 25,103 | 23,973 | 4,124 | 7,739 |
| 1957 | 20,292 | 22,211 |  | 22,336 | 22,265 | 4,013 | 9,666 |
| 1958 | 19,550 | 19,882 |  | 19,992 | 21,264 | 3,713 | 9,574 |
| 1959 | 25,414 | 22,827 |  | 22,797 | 22,781 | 4,942 | 14,789 |
| 1960 | 19,254 | 17,973 |  | 18,835 | 18,114 | 5,150 | 12,114 |
| 1961 | 14,740 | 14,572 |  | 14,365 | 15,162 | 6,309 | 13,761 |
| 1962 | 14,370 | 14,101 |  | 14,213 | 15,266 | 3,385 | 12,404 |
| 1963 | 14,774 | 14,660 |  | 14,182 | 14,423 | 7,442 | 12,080 |
| 1964 | 12,882 | 13,172 |  | 12,874 | 13,619 | 6,219 | 11,348 |
| 1965 | 14,079 | 15,475 |  | 14,557 | 15,228 | 8,456 | 16,096 |
| 1966 | 9,882 | 12,061 |  | 13,372 | 13,090 | 4,974 | 19,952 |
| 1967 | 6,731 | 8,185 |  | 8,456 | 8,856 | 2,541 | 17,082 |
| 1968 | 4,914 | 6,457 |  | 6,764 | 7,031 | 3,083 | 15,219 |
| 1969 | 4,708 | 5,727 |  | 5,856 | 6,196 | 2,051 | 13,980 |
| 1970 | 2,597 | 3,675 |  | 3,979 | 3,938 | 1,837 | 17,437 |
| 1971 | 1,532 | 2,417 |  | 3,148 | 3,659 | 2,750 | 17,330 |
| 1972 | 2,995 | 2,947 |  | 3,522 | 4,022 | 4,766 | 26,961 |

Source: Tanners' Council of America, Inc.

Table A-11. U. S. cattlehide exports by countries (1,000 pieces)

| Country of Destination | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 |
|---|---|---|---|---|---|---|---|---|
| Canada | 676 | 1,720 | 850 | 1,030 | 1,013 | 761 | 883 | 894 |
| Mexico | 1,217 | 803 | 1,551 | 1,840 | 1,721 | 2,046 | 2,195 | 1,776 |
| Honduras | - | 2 | 12 | 21 | 8 | 10 | 4 | - |
| Colombia | - | 32 | 4 | 1 | 1 | - | 1 | - |
| Venezuela | 47 | 2 | 1 | 5 | 4 | 1 | 13 | 12 |
| Salvador | 12 | - | - | - | - | - | - | - |
| Chile | - | - | - | - | - | - | - | 261 |
| Peru | - | 5 | - | - | - | - | 2 | 20 |
| Other Latin America | 16 | 8 | 1 | - | - | 2 | 14 | 27 |
| West Germany | 1,235 | 775 | 575 | 790 | 760 | 714 | 576 | 588 |
| Sweden | 54 | 55 | 30 | 33 | 37 | 25 | 7 | 6 |
| United Kingdom | 606 | 504 | 99 | 289 | 328 | 166 | 171 | 189 |
| Netherlands | 1,705 | 1,150 | 323 | 594 | 537 | 332 | 306 | 306 |
| Denmark | 16 | 24 | 7 | 3 | 4 | - | 9 | - |
| Belgium | 84 | 85 | 29 | 22 | 37 | 25 | 29 | 78 |
| Norway | 24 | 30 | 11 | 15 | 17 | 7 | 4 | - |
| Finland | 27 | 25 | 3 | 24 | 21 | 20 | 13 | 13 |
| France | 126 | 234 | 207 | 297 | 263 | 287 | 544 | 753 |
| Switzerland | 95 | 29 | 4 | 14 | 21 | 12 | 18 | 3 |
| Italy | 624 | 710 | 57 | 203 | 431 | 335 | 62 | 179 |
| Portugal | 17 | 14 | 15 | 17 | 11 | 5 | 5 | 42 |
| Greece | 37 | 74 | 18 | 17 | 33 | 29 | 8 | 19 |
| Spain | 363 | 368 | 271 | 317 | 262 | 260 | 842 | 758 |
| Austria | 48 | 45 | 42 | 55 | 40 | 59 | 11 | 23 |
| Bulgaria | - | - | - | - | - | - | 5 | 65 |
| Hungary | 97 | 42 | 4 | 25 | 5 | 36 | 130 | 93 |
| E. Germany | - | - | - | - | 6 | 25 | 20 | - |
| Poland | 227 | 349 | 218 | 243 | 274 | 152 | 472 | 545 |
| Yugoslavia | 112 | 269 | 311 | 147 | 272 | 459 | 229 | 210 |
| U.S.S.R. | 922 | 1,230 | 1,836 | 383 | 1,223 | 1,492 | 1,252 | 523 |
| Rumania | 241 | 474 | 145 | 76 | 379 | 449 | 571 | 1,201 |
| Czechoslovakia | 222 | 257 | 191 | 297 | 312 | 499 | 694 | 852 |
| Other Europe | 9 | 18 | 6 | 9 | - | - | - | 18 |
| Tunisia | - | 4 | 14 | 39 | 9 | 15 | 5 | 20 |
| Iraq | 13 | 4 | - | - | - | - | - | - |
| Turkey | 351 | 440 | 375 | 109 | 124 | 113 | 69 | 42 |
| Israel | 134 | 86 | 98 | 113 | 127 | 109 | 107 | 117 |
| Japan | 3,777 | 3,994 | 4,197 | 5,259 | 6,006 | 6,206 | 6,010 | 7,246 |
| Australia | 6 | 7 | 3 | 2 | 4 | 2 | 3 | - |
| Hong Kong | 20 | 69 | 3 | 5 | 25 | 33 | 29 | 64 |
| Philippine Republic | 57 | 57 | 84 | 88 | 64 | 63 | 43 | 10 |
| Korea Republic | 34 | 142 | 170 | 333 | 257 | 271 | 357 | 414 |
| China Taiwan | 40 | 28 | 72 | 104 | 125 | 188 | 247 | 215 |
| Iran | - | 3 | 1 | - | 1 | - | - | - |
| Other Asia | 12 | 2 | 7 | 20 | 10 | 13 | 3 | 2 |
| Other | 6 | 20 | 8 | 1 | 6 | 1 | - | 5 |
| Total U.S. | 13,309 | 14,189 | 11,853 | 12,840 | 14,778 | 15,222 | 15,963 | 17,589 |
| Argentine exports | 6,811 | 8,125 | 8,658 | 8,302 | 8,265 | 7,506 | 3,363 | 1,344 |

Source: Tanners' Council of America, Inc.

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## Table A-12. Wet process leather tanning plants by size and location

| | X-S | S | M | L | X-L | Total |
|---|---|---|---|---|---|---|
| New England | | | | | | |
| Delaware | - | - | 1 | - | - | 1 |
| Maine | - | 4 | - | 3 | - | 7 |
| Massachusetts | - | 23 | 11 | 3 | - | 37 [1] |
| New Hampshire | - | 4 | 3 | 2 | - | 9 |
| Vermont | - | - | 1 | - | - | 1 |
| | | 31 | 16 | 8 | | 55 |
| Mid Atlantic | | | | | | |
| New York | - | 17 | 6 | 2 | - | 25 [2] |
| New Jersey | 1 | 5 | 4 | 2 | - | 12 |
| Pennsylvania | - | 7 | 1 | 4 | - | 12 |
| Maryland | - | 1 | - | - | - | 1 |
| | 1 | 30 | 11 | 8 | | 50 |
| South | | | | | | |
| Georgia | - | 1 | - | - | - | 1 |
| Florida | - | 1 | - | - | - | 1 |
| Kentucky | - | 2 | - | 1 | - | 3 |
| North Carolina | - | 1 | 1 | - | - | 2 |
| Tennessee | - | 3 | 3 | 1 | - | 7 |
| West Virginia | - | 1 | - | 2 | - | 3 |
| Virginia | - | 1 | - | 1 | - | 2 |
| Texas | - | 1 | - | - | - | 1 |
| | | 11 | 4 | 5 | | 20 |
| Mid West | | | | | | |
| Illinois | 4 | 5 | 1 | 1 | - | 11 |
| Indiana | - | 2 | - | - | - | 2 |
| Iowa | - | 1 | 1 | - | - | 2 |
| Michigan | - | - | 1 | 2 | - | 3 |
| Minnesota | - | 1 | - | - | 1 | 2 |
| Missouri | - | 2 | - | - | 1 | 3 |
| Ohio | - | 2 | 1 | - | - | 3 |
| Wisconsin | - | 9 | 3 | 2 | 3 | 17 |
| | 4 | 22 | 7 | 5 | 5 | 43 |
| West Coast | | | | | | |
| California | - | 3 | 4 | 2 | - | 9 |
| Oregon | 1 | 1 | 1 | - | - | 3 |
| | 1 | 4 | 5 | 2 | | 12 |
| Total | 6 | 98 | 43 | 28 | 5 | 180 |

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[1] 28-30 plants in Boston Metropolitan area

[2] 20 plants located in Fulton County

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## Selected References

1. USDI, Federal Water Pollution Control Administration, The Cost of Clear Water,"Volume III Industrial Waste Profile No. 7 -- Leather Tanning and Finishing," September, 1967.

2. The President's Council on Environmental Quality, The Leather Industry--a Study of the Impact of Pollution Control Costs, prepared by Urban Systems Research and Engineering, Inc., December, 1971.

3. U. S. Environmental Protection Agency, Development Document for Effluent Limitation Guidelines and Standards of Performance - Draft. Prepared by Stanley Consultants, Inc., June, 1973.

4. USDC, Census of Manufactures 1967 and Earlier, Bureau of the Census, U. S. Government Printing Office, Washington, D. C., 1971.

5. USDC, Annual Survey of Manufacturers, 1971 and earlier, Bureau of the Census, Washington, D. C., 1972.

6. Tanners' Council of America, "Membership Bulletin Leather Industry Statistics, 1955-1972," Trade Survey Bureau, Tanners' Council of America, Inc., New York, New York, 1973.

7. Poats, Fred. "Cattle Hides and Shoe Prices," Marketing and Transportation Situation, Marketing Economic Division, USDA, Washington, D. C., August, 1972.

8. Baker, Allen J., "Hides and Skins," Livestock Marketing Situation, Economic Research Service, USDA, Washington, D. C., November, 1971.

9. Thompson, John W., "Marketing Spreads for Leather Products," Marketing and Transportation Situation, Marketing Economic Division, Economic Research Service, USDA, Washington, D. C., February, 1965.

10. Thompson, John W. and Poats, Frederick J., "Economics of Segmenting Cattle Hides," Marketing Economics Division, Economic Research Service, USDA, Washington, D. C., 1965.

11. Poats, Frederick J. and Thompson, John W., "Alternative Markets for Cattle Hide Trim," Marketing Economics Division, Economic Research Service, USDA, Washington, D. C., February, 1965.

12. New England Tanners Club, "Leather Facts," Peabody, Mass., 1972.